Technical Guidance for Completing Specified Gas Compliance Reports

Version 4.0

February 2011

Government of Alberta

Alberta

Disclaimer:
The information provided in this document is intended as guidance to support government regulation. This document is not a substitute for the law. Please consult the *Specified Gas Emitters Regulation* and the legislation for all purposes of interpreting and applying the law. In the event that there is a difference between this document and the *Specified Gas Emitters Regulation* or legislation, the *Specified Gas Emitters Regulation* or the legislation prevails.

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Abbreviations

AENV	Alberta Environment
BEI	Baseline Emissions Intensity
CCEMA	Climate Change and Emissions Management Act
CCEMF	Climate Change and Emissions Management Fund
CH_4	Methane
CICA	Canadian Institute of Chartered Accountants
CO_2	Carbon Dioxide
CO_2e	Carbon Dioxide Equivalent
DUNS	Data Universal Numbering System
EI	Emissions Intensity
EPC	Emission Performance Credit
EPEA	*Environmental Protection and Enhancement Act*
EUB	Energy and Utilities Board
ERCB	Energy Resources Conservation Board
FC	Fund Credit
GJ	Gigajoule
GWP	Global Warming Potential
h	Hour
HFC	Hydrofluorocarbon
HHV	Higher Heating Value
IP	Industrial Process
IPCC	Intergovernmental Panel on Climate Change
ISAE	International Standard on Assurance Engagements
ISO	International Organization for Standardization
kg	Kilogram
kJ	Kilojoule
kt	Kilotonne
LHV	Lower Heating Value
MWh	Megawatt-hour
N_2O	Nitrous Oxide
N/A	Not Applicable
NAICS	North American Industry Classification System
NEI	Net Emissions Intensity
NEIL	Net Emissions Intensity Limit
NGCC	Natural Gas Combined Cycle
NPRI	National Pollutant Release Inventory

P	Production
PFC	Perfluorocarbon
RT	Reduction Target
SF_6	Sulphur Hexafluoride
SGER	Specified Gas Emitters Regulation
SoC	Statement of Certification
SoQ	Statement of Qualification
SoV	Statement of Verification
TDE	Total Direct Emissions
TAE	Total Annual Emissions
t	Tonnes

Abbreviations

AENV	Alberta Environment
BEI	Baseline Emissions Intensity
CCEMA	Climate Change and Emissions Management Act
CCEMF	Climate Change and Emissions Management Fund
CH_4	Methane
CICA	Canadian Institute of Chartered Accountants
CO_2	Carbon Dioxide
CO_2e	Carbon Dioxide Equivalent
DUNS	Data Universal Numbering System
EI	Emissions Intensity
EPC	Emission Performance Credit
EPEA	*Environmental Protection and Enhancement Act*
EUB	Energy and Utilities Board
ERCB	Energy Resources Conservation Board
FC	Fund Credit
GJ	Gigajoule
GWP	Global Warming Potential
h	Hour
HFC	Hydrofluorocarbon
HHV	Higher Heating Value
IP	Industrial Process
IPCC	Intergovernmental Panel on Climate Change
ISAE	International Standard on Assurance Engagements
ISO	International Organization for Standardization
kg	Kilogram
kJ	Kilojoule
kt	Kilotonne
LHV	Lower Heating Value
MWh	Megawatt-hour
N_2O	Nitrous Oxide
N/A	Not Applicable
NAICS	North American Industry Classification System
NEI	Net Emissions Intensity
NEIL	Net Emissions Intensity Limit
NGCC	Natural Gas Combined Cycle
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P	Production
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RT	Reduction Target
SF_6	Sulphur Hexafluoride
SGER	Specified Gas Emitters Regulation
SoC	Statement of Certification
SoQ	Statement of Qualification
SoV	Statement of Verification
TDE	Total Direct Emissions
TAE	Total Annual Emissions
t	Tonnes

Related AENV Publications

- Climate Change and Emissions Management Act
- Specified Gas Emitters Regulation
- Specified Gas Reporting Regulation

- Alberta's 2008 Climate Change Strategy

- Technical Guidance for Completing Baseline Emissions Intensity Applications
- Additional Guidance for Cogeneration Facilities
- Technical Guidance for Landfill Operators

- Technical Guidance for Developing Offset Projects
- Offset Protocol Development Guidance Document
- Quantification Protocols (http://environment.alberta.ca/1238.html)

Specified Gas Emitters Regulation Forms

- Baseline Emissions Intensity Application Form
- 2010 Compliance Report Form
- 2010 Compliance Report Form for Stand-Alone Cogeneration Facilities

- Landfill without gas collection workbook
- Landfill with partial gas collection workbook
- Landfill with gas collection workbook

1.0 Purpose of this Document

The purpose of this document is to assist facilities regulated under the *Specified Gas Emitters Regulation* (the *Regulation*) in completing annual compliance reports. It also provides information on the compliance options available for facilities that are not able to meet their emissions reduction target through facility level improvements.

Compliance reporting is used to compare a facility's annual emissions intensity to its approved net emissions intensity limit. Facilities that are not able to meet their reduction obligation through direct facility improvements can utilize one or more of the available compliance options to meet their net emissions intensity limit. Facilities may submit offset credits that are serialized on the Alberta Emissions Offset Registry, submit serialized emission performance credits generated at a regulated facility that has reduced its emissions intensity below its net emissions intensity limit, or purchase fund credits from the Climate Change and Emissions Management Fund.

Facilities that do not exceed the emissions threshold may voluntarily report their greenhouse gas emissions through the *Specified Gas Reporting Program* (note that the annual emissions threshold for the *Specified Gas Reporting Regulation* has been lowered to 50,000 tonnes CO_2e starting in the 2010 reporting period). More information regarding this program is available on Alberta Environment's greenhouse gas reporting website at http://environment.alberta.ca/02166.html. Facilities whose emissions are below the threshold for the *Specified Gas Emitters Regulation* threshold are also eligible to generate emissions offset credits by implementing voluntary greenhouse gas reduction projects using one or more of Alberta's approved offset quantification protocols. More information regarding Alberta's offset system is available at http://environment.alberta.ca/0923.html.

1.1 Overview of Changes

The following key changes have been made to this document for the 2010 compliance cycle:

- A simplified process flow diagram showing material flows and emission sources labelled by source category must now be provided with each compliance report and baseline emissions intensity application. See Section 3.5 for more information.
- The 5-year maximum for facilities using the same third party verifier has been clarified. See Section 9.1.4 for more information.
- The negligibility threshold has been set at the **lesser of** 1000 tonnes CO_2e or 1% of a facility's total annual emissions, on an aggregate basis. See Section 5.1 for more information.
- The treatment of phased expansions for in situ oil sands extraction facilities has been formalized. See Section 3.7.3.2 for more information.
- The classification of industrial process emissions has been clarified. In particular, if the product of an industrial process is combusted or vented (e.g. hydrogen being

used as a fuel or flared or vented rather than as a process feed stock) the emissions associated with that product are not considered industrial process emissions. See Section 5.2.2 for more information.

- The process for purchasing fund credits has changed. The fund credit purchase form found in the new consolidated form is now to be used. One form should be submitted for each cheque, and can include several facilities. See Section 4.4 for more information.
- Clarification regarding the roles and requirements of the lead verifier, the peer reviewer, and the designated signing authority has been provided. See Section 9.1.7 for more information.
- Additional clarification regarding the requirement of a site visit as part of third party verification has been provided. See Section 9.2.3 for more information.
- An additional provision regarding the treatment of new facilities has been implemented. In particular, where a new facility does not include a significant advancement in technology with respect to emissions intensity relative to older facilities in the sector, sector performance standards may be used to set a facility's baseline emissions intensity. See Section 3.7.5 for more information.
- The error correction policy regarding offset credits has been further developed. See Section 4.3.3 for more information.

1.2 Potential Future Changes

The following areas have been identified for potential change in future compliance periods:

- Cogeneration treatment remains unchanged for 2010, but changes will take effect for the 2011 compliance period.
- Use of refinery activity index and inlet gas as production denominators will still be accepted for the 2010 compliance cycle. These denominators are under review by Alberta Environment and more guidance will be provided in future versions of this document.
- No changes have been made to the exemption of industrial process emissions from the total annual emissions calculation for the 2010 compliance cycle. Alberta Environment may make changes for future compliance periods. More detailed communication and consultation will take place in advance of significant changes to this policy.
- Alberta Environment is reviewing the implications of removing CO_2 emissions from the combustion and decomposition of biomass from the emissions threshold calculation for the *Regulation*.
- The compliance deadline remains March 31 for the 2010 compliance cycle. Alberta Environment recognizes the issues surrounding this deadline.
- The level of assurance for third party verification remains at **limited** for the 2010 compliance cycle, but will move to **reasonable** starting January 1, 2012 for the 2012 compliance cycle.
- Alberta Environment continues to work with national accreditation bodies to determine appropriate accreditation requirements for third party verifiers. More

information on future accreditation requirements will be provided when they are available.

- Certain emission reduction activities at regulated facilities, including the reduction of electricity or other indirect emissions, are not currently recognized within the *Specified Gas Emitters Regulation*. Alberta Environment is looking at potential methods to create appropriate incentive for these activities.

2.0 Overview of the Specified Gas Emitters Program

In 2002, Alberta passed the *Climate Change and Emissions Management Act* (the *Act*), signalling its commitment to manage the impacts of climate change and greenhouse gas emissions in the province. In 2003, Alberta passed the *Specified Gas Reporting Regulation* requiring all facilities emitting over 100,000 tonnes of carbon dioxide equivalent (CO_2e) annually to report their greenhouse gas emissions.

In 2007, Alberta passed the *Specified Gas Emitters Regulation*, reinforcing its commitment to regulate greenhouse gas emissions from large facilities. This regulation requires all facilities in Alberta emitting over 100,000 tonnes of CO_2e per year to reduce their annual emissions intensity (total annual emissions per unit of production) by 12 per cent from their 2003-2005 baseline emissions intensity. New facilities have been given a graduated reduction obligation of 2 per cent per year starting in their 4th year of commercial operations up to a reduction obligation of 12 per cent below the emissions intensity of their third year of operation. New facilities are facilities that began operation on or after January 1, 2000 and have completed less than 8 years of commercial operation.

Greenhouse gas emissions intensity is regulated on a facility-by-facility basis. Targets are set at each facility and the facility's performance over time is compared against its approved baseline emissions intensity. Alberta Environment supports and encourages consistency in reporting methodologies across individual sectors. Where appropriate, sectors are encouraged to develop sector-specific reporting methodologies that improve accuracy and consistency in reporting of greenhouse gas emissions for that sector.

The *Regulation* also encourages facilities to improve emissions performance relative to production. This can be achieved through a number of initiatives, including without limitation incremental improvements in on-site energy use, development of emissions offset projects, and supporting development and implementation of new emissions reduction technologies.

2.1 Thresholds

The threshold for determining if a facility is subject to the *Specified Gas Emitters Regulation* has been set at 100,000 tonnes of CO_2e per year of total direct emissions. A facility's total direct emissions must include all greenhouse gas emissions sources on site, including CO_2 emissions from the combustion and decomposition of biomass and industrial process emissions. Facilities that exceed the emissions threshold in any single calendar year on or after 2003 are considered **regulated facilities**. All regulated facilities are required to establish a baseline emission intensity and submit annual compliance reports. The *Regulation* currently includes facilities in the following industrial sectors:

- Chemical Manufacturing
- Coal Mining
- Conventional Oil and Gas Extraction

- Forestry Products
- Mineral Manufacturing
- Oil Sands In Situ Extraction
- Oil Sands Mining and Upgrading
- Petroleum Refineries
- Pipeline Transportation
- Utilities
- Waste Management

2.2 Reduction Obligations

The *Specified Gas Emitters Regulation* requires all regulated facilities to reduce their annual emissions intensity by 12 per cent below their approved baseline emissions intensity. This value is known as the net emissions intensity limit for the facility.

Established facilities are facilities that completed their first year of commercial operation on or before January 1, 2000, or that have completed eight or more years of commercial operation. Established facilities have a 12 per cent reduction obligation relative to their baseline emissions intensity.

New facilities are those facilities that completed their first year of commercial operation on or after December 31, 2000 and have completed less than eight years of commercial operation. Emissions intensity reduction obligations for these facilities are phased in over a 6-year period at rate of 2 per cent per year beginning in the fourth year of commercial operations, as depicted in Table 1.

Net Emissions Intensity Limit for New Facilities		
Year1	First full calendar year of commercial operation	No target
Year 2	Second year of commercial operation	No target
Year 3	Establish baseline.	No target (baseline)
Year 4	First year reduction obligation	2% target
Year 5	Second year reduction obligation	4 % target
Year 6	Third year reduction obligation	6 % target
Year 7	Fourth year reduction obligation	8 % target
Year 8	Fifth year reduction obligation	10 % target
Year 9	Considered an established facility	12 % target

Table 1: New facility reduction obligation based on the number of years of commercial operation.

2.3 Compliance Options

Facilities that are not able to meet their reduction obligation through performance improvements (e.g. technology improvements, changes in maintenance and/or operations, etc.) may use one or more of the following compliance options:

1) Emission performance credits;
2) Offset credits; and
3) Fund credits.

More information on these compliance options is available in Section 4.0.

Facilities must submit sufficient credits such that their net emissions intensity is equal to the facility's net emissions intensity limit. Net emissions intensity is calculated as total annual emissions minus the credits being submitted, all divided by annual production. Credits from each of the three true-up options listed above are counted equally at one tonne of CO_2e per credit.

Facilities that reduce their annual emissions intensity below their net emissions intensity limit are eligible to request emission performance credits, which can be banked for future use at the same facility or traded/sold to other Alberta facilities that have not met their reduction targets. Emission performance credits must be serialized by Alberta Environment before they can be used as a compliance option.

2.4 Specified Gas Reporting Program

The Specified Gas Reporting program, operated in accordance with the *Specified Gas Reporting Regulation*, is a complementary program that requires all large industrial

emitters to report their annual greenhouse gas emissions. As of January 1, 2011, the following changes will apply to the Specified Gas Reporting program:

- Mandatory reporting threshold has been lowered to 50,000 tonnes CO_2e per year.
- CO_2 emissions from combustion and decomposition of biomass are included in the reporting program threshold calculations and must be reported annually.
- The quantities of CO_2 injected on site, CO_2 sent off site, and CO_2 received on site must be reported annually.
- The quantities of electricity produced and consumed on site must be reported annually.

More information on the specified gas reporting program is available in the Specified Gas Reporting Standard available at http://environment.alberta.ca/02166.html.

3.0 Specified Gas Emitters Regulation Compliance Information

All facilities regulated under the *Specified Gas Emitters Regulation* must submit annual compliance reports. Facilities that undergo decommissioning or significant changes to the operation such that they no longer fit the definition of "Facility" prescribed in the *Regulation* may be removed from the *Regulation* upon receipt of written notice from the Director. Decommissioning is discussed in more detail in Section 3.7.4 below and in the Technical Guidance for Completing Baseline Emissions Intensity Applications.

3.1 Baseline Emissions Intensity Establishment

Before submitting annual compliance reports, all regulated facilities must establish a baseline emissions intensity by submitting a baseline emissions intensity application to Alberta Environment for review and approval. More information regarding the baseline emissions intensity application process can be found in the Technical Guidance for Completing Baseline Emissions Intensity Applications.

3.2 Submission Deadline

The submission deadline for the 2010 Specified Gas Compliance Report is March 31, 2011. Alberta Environment recognizes the time constraints imposed by this deadline and is reviewing the implications of adjusting the submission deadline for future cycles.

3.3 Third Party Verification

All compliance reports must be verified by a third party verifier to ensure accuracy of the submission and verify compliance with the *Regulation*. More information on verification is available in Section 9.0.

3.4 Signatures

The *Electronic Transactions Act* allows for the use of electronic signatures in place of written signatures. Electronic signatures must be sufficient to identify the person signing and must be consistent with the purpose of the document or record being signed. Alberta Environment will accept electronic signatures for the purposes of compliance under the *Specified Gas Emitters Regulation*, but reserves the right to request signed originals where the electronic signature is ambiguous or cannot be verified.

3.5 Required Submission Documents

The following documents must be completed and submitted to Alberta Environment by the submission deadline:

- Third party verified specified gas compliance report (in the original electronic format provided by Alberta Environment);
- Additional supporting documents, including:

- Calculation methodologies, if not included in Section C.
- Simplified process flow diagram showing material flows and emission sources labelled by source category.

☐ Third party verification report,
☐ Signed Conflict-of-Interest checklist,
☐ Signed Statement of Certification form,
☐ Signed Statement of Qualification form,
☐ Signed Statement of Verification form,
☐ Signed Emission Performance Credit Request form, if applicable.
☐ Applicable supporting documentation for compliance true-up
- For emission performance credits,
  - If purchased from another company, or transferred between facilities owned by the same company, a letter of transfer, including serial numbers, signed by both parties acknowledging the transfer of ownership;
- For offset credits,
  - A copy of the confirmation of initiation of retirement for offset credits generated by the Alberta Emissions Offset Registry;
- For fund credits,
  - Payment and the completed fund credit purchase form must be submitted to the Minister of Finance. A copy of the fund credit purchase receipt will be automatically forwarded to Alberta Environment once payment is processed;

☐ A confidentiality request letter, if applicable. More information regarding confidentiality is provided in Section 8.0.

To avoid delays in the Alberta Environment review process, facilities are encouraged to request their third party verifier to review the documentation associated with all credit options being submitted for compliance.

Sufficient information should be supplied to allow Alberta Environment to understand the annual compliance report and underlying calculations. Providing sufficient information can reduce the time required for Alberta Environment to review and accept the submission as complete.

3.6 Submission Process

Compliance reports may be submitted electronically to AENV.GHG@gov.ab.ca. For administrative purposes, separate e-mail submissions must be made for each facility.

Alternatively, electronic documents may be submitted on electronic storage media (e.g. USB flash drive, compact disc, etc.) to the address below. Signed documents may be submitted either electronically (with the appropriate electronic signature), or in hard copy to:

Director
Climate Change Secretariat
Alberta Environment
12th Floor Baker Centre
10025 106 Street NW
Edmonton, Alberta
T5J 1G4

An e-mail confirming receipt of the Specified Gas Compliance Report will be sent to the Reporter once the submission has been received. Alberta Environment will conduct a review of the completeness and the contents of each compliance report. In accordance with section 12 of the *Regulation*, Alberta Environment may request additional information or materials to support the review.

After the review has been completed, the Director will notify the facility in writing that either:

1) The compliance report submission has been reviewed and accepted as complete, and that the facility is in compliance with the *Regulation*; or
2) Corrective action is required for the facility to achieve compliance with the *Regulation*.

A schematic overview of the compliance submission process is provided in Figure 1 below.

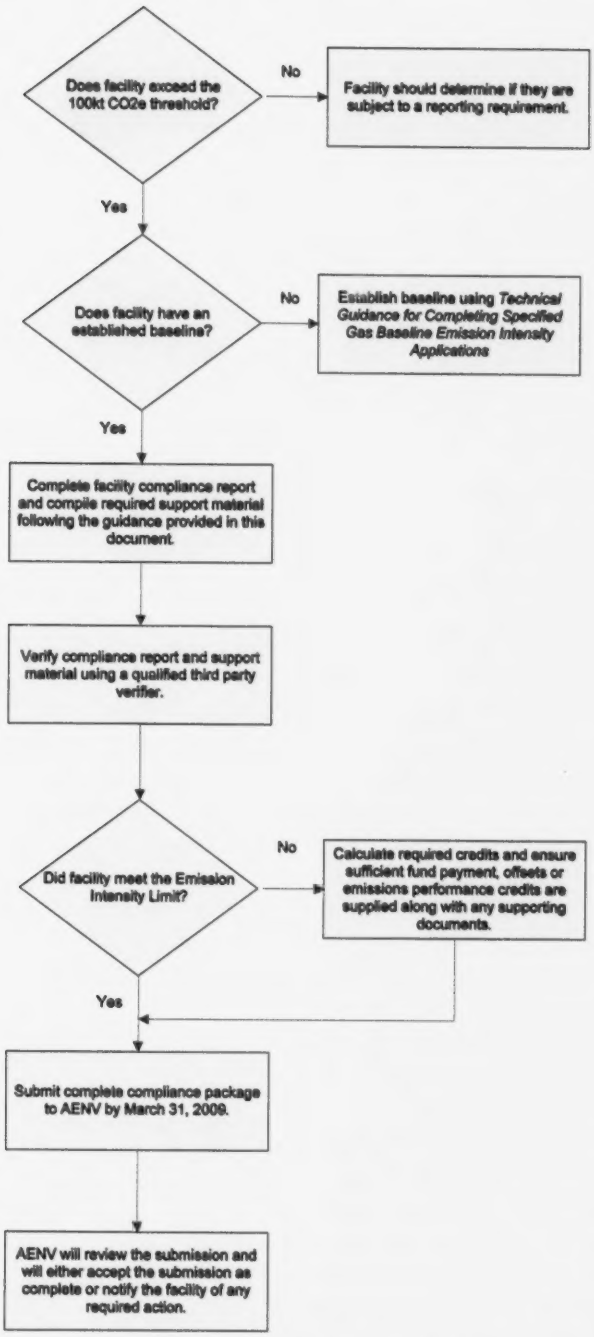
Does facility exceed the 100kt CO2e threshold?
No
Facility should determine if they are subject to a reporting requirement.
Yes
Does facility have an established baseline?
No
Establish baseline using *Technical Guidance for Completing Specified Gas Baseline Emission Intensity Applications*
Yes
Complete facility compliance report and compile required support material following the guidance provided in this document.
Verify compliance report and support material using a qualified third party verifier.
Did facility meet the Emission Intensity Limit?
No
Calculate required credits and ensure sufficient fund payment, offsets or emissions performance credits are supplied along with any supporting documents.
Yes
Submit complete compliance package to AENV by March 31, 2009.
AENV will review the submission and will either accept the submission as complete or notify the facility of any required action.

Figure 1: Compliance report submission review and decision tree.

3.7 Special Circumstances

3.7.1 Methodology Unavailability

Situations may occur where the calculation methodology used in the baseline emission intensity application is not available for use in an annual compliance report due to metering changes or data unavailability. In such cases, facilities should contact Alberta Environment to discuss the most appropriate path forward.

More information regarding emissions estimation methodologies is provided in Section 5.4 and in the Technical Guidance for Completing Baseline Emissions Intensity Applications.

3.7.2 Major Modifications

Whenever major modifications that affect production or emissions are made to a regulated facility, Alberta Environment must be notified. Major modifications may include installation of new equipment, replacement of old equipment, or changes to facility operation. Alberta Environment will work with the facility to determine the most appropriate path forward, which may include, without limitation, restatement of the baseline emissions intensity.

3.7.3 Phased Expansion

Phased expansion occurs when a facility is built to accommodate a series of expansion operations, which are typically included in its approval conditions. These facilities often exhibit significant changes in emissions intensity over the course of operation. For example, a facility may have a lower operating efficiency in early operation stages when the facility is overbuilt relative to production. In such cases, the emissions intensity typically improves as the phased expansions occur and the facility shifts to operations more consistent with the design capacity.

3.7.3.1 Phased Expansion Policy Principles

The following policy principles guided the considerations of any policy adjustments to account for phased facility expansion, and are reflected in the expansion treatment policy for *in situ* oil sands extraction facilities in Section 3.7.3.2 below:

- Expanding facilities will still be subject to the *Regulation*.
- A price signal to incent emissions performance improvements will be maintained on all facility emissions.
- Expansion alone should not be a mechanism for meeting the net emission intensity limit, generating credits, or exempting emissions from the *Regulation*.
- Baseline emissions intensities must be a relevant reference point for evaluating ongoing compliance operation of facility.
- Adaptation to expansion should minimize administrative burden on both the facilities and Alberta Environment.

- The policy should be sufficiently robust to deal with most expansions as consistently as possible, but Alberta Environment will retain flexibility to deal with special scenarios.
- The expansion policy should have consistent logic with the overall system.
- Expansion should not result in excessive/punitive compliance burden.
- Significant expansions occurring in the baseline period should be similarly dealt with to avoid a dilution of the ongoing reduction target at the facility.
- The policy should separate the impact of phased expansion and the impact of innovation and technology improvement where possible. It should apply the same logic applied across the overall *Regulation* for dealing with technology improvements.

3.7.3.2 Phased Expansion Treatment for the In Situ Oil Sands Extraction Sector

During expansion start up in the *in situ* oil sands extraction sector there is a period lasting up to a year of virtually full emissions with little to no production, which creates high emissions intensity. This occurs in all new wells, but for facilities operating at constant steam capacity, the effects are typically diluted by numerous wells coming online and offline simultaneously. However, when a large portion of new steam capacity (causing a significant increase in emissions as referenced below) is added to a facility there will be a large number of wells in this high intensity start-up phase at the same time, potentially swinging the facility's aggregate emissions intensity significantly relative to ongoing operation. The following policy treatment for expansions in the *in situ* expansion sector has been developed in consultation with the sector to address this situation.

To be eligible to request expansion treatment, facilities must demonstrate:

a) A significant step change in emissions (25 per cent increase) associated with the addition of physical steam generation and production infrastructure **AND**;
b) The facility's emissions intensity has been affected by the expansion by more than 10% compared to the baseline emissions intensity.

To qualify, facilities must also have a clear, accurate basis for separating both the emissions and production between the expansion phase and the existing facility (i.e. separation between existing and expansion portions of the facility must be able to pass verification). Where it is not possible to separate out the emissions and production associated with the expansion, the whole facility will report against the existing baseline emissions intensity.

The emissions and production from the expansion portion of the facility associated with new equipment **AND** new areas of the reservoir (areas not impacted by previous facility operation) are submitted separately for the first partial year and, if necessary, the first full year of expansion operation to isolate the impact of the initial intensity spike. While the expansion is separated, the baseline period for the expansion portion of the facility is the same as the compliance period (as shown in the diagram below). After the first full year

of operation of the expansion, all of the facility's emissions and production are combined into one common compliance submission using:

a) The original facility's baseline intensity if this is still a valid reference (i.e. the expansion uses similar technology and has similar reservoir characteristics); **OR**
b) A new combined representative baseline which can roll into a three year production weighted average as shown in Figure 2, similar to the establishment of baseline emission intensities new in situ facilities. See the Technical Guidance for Completing Baseline Emissions Intensity Applications document for more detail.

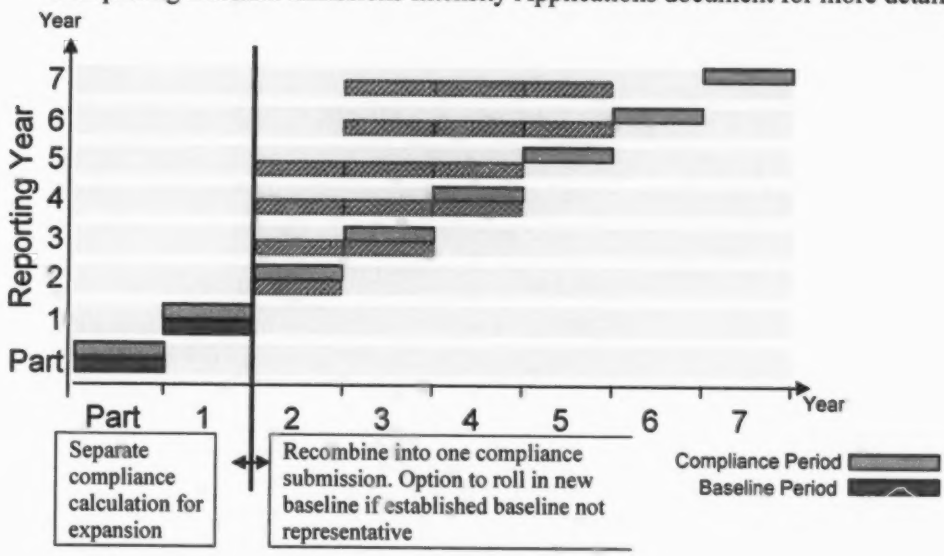

Figure 2: Policy for phased expansion of in situ oil sands facilities.

The expansion portion is assigned a separate baseline emission intensity and net emission intensity limit during initial operations, as described above, but the reduction target remains equal to that of the original facility. In cases where a significant improvement in the technology beyond business as usual can be demonstrated, and the improvements are not already reflected in reduced compliance obligation, special consideration such as reduction target phase in may be requested and will be reviewed on a case-by-case basis.

Where an expansion has occurred during the baseline period, the emissions and production associated with the expansion will be excluded from the facility's baseline emissions intensity calculation.

Note: *Alberta Environment maintains the flexibility to account for significant changes or anomalies in operation on a facility by facility basis, including the ability to update the baseline year for a facility if the approved baseline is not representative.*

3.7.4 Decommissioning

Alberta Environment recognizes that production may decline more rapidly than emissions as some facilities reach the end of their operating life, causing a significant increase in

emissions intensity. Regulated facilities with emissions below the threshold level, where both production and total annual emissions are in decline, can apply for a special declining production baseline emissions intensity. These situations will be handled on a case-by-case basis.

Facilities whose approval status under the *Environmental Protection and Enhancement Act* (EPEA) has been amended to "decommissioned" should notify Alberta Environment in order to be released from the requirements of the *Specified Gas Emitters Regulation.*

Facilities that do not have an EPEA approval must demonstrate to Alberta Environment that no production or direct emissions are occurring or are planned to occur at the facility and that the facility is being decommissioned to be released from the requirements of the *Regulation.*

3.7.5 New Facility

New facility treatment recognizes that newly built facilities are typically built to higher design standards than older facilities. New Facility treatment under the *Regulation* recognizes these improvements by assigning a graduated compliance target for new builds. This category only applies to newly built facilities, and does not apply to facilities undergoing major modifications described in Section 3.7.2 above.

Where new facilities do not include a significant advancement in technology with respect to emissions intensity relative to older facilities in the sector, sector performance standards may be used to determine baseline emission intensities. Sector performance standards will be developed in consultation with industry.

New facilities should consult the Technical Guidance for Completing Baseline Emissions Intensity Applications for information regarding the establishment of baseline emission intensities.

3.8 Corrections to Compliance Submission Errors

3.8.1 Detection and Correction of Errors

Situations may occur where errors are detected in a facility's annual compliance submission (including discrepancies between a compliance submission and the associated baseline emissions intensity application). Errors may be detected by facilities, third party verifiers, Alberta Environment, or through Alberta Environment's audit process. All errors must be disclosed to Alberta Environment.

When errors are identified, Alberta Environment will work with the affected facility to determine the most appropriate corrective action, including whether or not reconciliation of past compliance obligations is required (i.e. adjustment of credits required or emission performance credits granted). The required corrective action will depend on the nature and magnitude of the error.

Typically, **immaterial** errors will require correction on a go-forward basis, and **material** errors will require both retroactive and go-forward correction. See Section 9.1.8 for a discussion regarding materiality.

In cases where errors have a significant effect on the compliance obligation associated with affected compliance submissions, retroactive reconciliation will typically be required. Retroactive adjustment of compliance obligations will be made up to a maximum of three compliance periods preceding the most recent submission deadline. For example, after March 31, 2011, adjustment of previous compliance obligations will only be considered for the 2010, 2009, and 2008 compliance periods.

Where retroactive correction of errors is not required, facilities may propose voluntarily corrections. In such cases, Alberta Environment may require third party verification of the correction, depending on the extent of the changes.

In situations where facilities update or improve calculation methodologies, and these updates are applied to past submissions, adjustment of past compliance obligations will not be made if consistent methodologies were used between the previously accepted baseline and compliance submissions. More information regarding calculation methodologies can be found in Section 5.4.

Note: *The above error correction policies do not apply where corrections are required as the result of an investigation or offence under the Climate Change and Emissions Management Act. In such cases, the extent of the required correction will be determined based on the specific situation, and reconciliation of compliance obligations may be required for* ***all*** *affected compliance submissions.*

3.8.2 Compliance Adjustments

Reconciliation of past compliance obligations will be made through payment into the Climate Change and Emissions Management Fund at the fund price applicable to that compliance period

In cases where adjustment of a facility's past compliance obligation results in over-compliance (i.e. the corrected net emission intensity is less than the facility's net emission intensity limit), Alberta Environment will reconcile this amount in accordance with the following process (in the specified order):

1) If fund credits were purchased for the original true-up, they will be refunded at the value that was originally paid, up to a maximum of the number of fund credits submitted for the facility.
2) If offset credits or emission performance credits were submitted for true-up, and an error correction was made during the facility's compliance review, Alberta Environment will only confirm retirement of the total tonnes of credits required to achieve compliance. Additional credits will remain active

on the registry under that facility's name and will be available for use in future compliance periods.

3) If offset credits or emission performance credits were submitted for true-up, and error correction is made after the facility's compliance report was reviewed, accepted as complete and the credits were retired, the retired tonnes will be carried forward to the next compliance period in which credits are required. This carryover is non-transferable and must be used as the first compliance option at the facility.

4) If emission performance credits were requested or generated by the facility, the number of emission performance credits will be adjusted to reflect the corrected compliance report. If the total number of emission performance credits increases, additional credits will be issued. If the total number of emission performance credits decreases and serial numbers have already been issued, some of the previously issued credits will be revoked.

4.0 Compliance Options

4.1 Facility Improvements

Facilities are encouraged to implement operational improvements to reduce greenhouse gas emissions relative to production output. Decreases in annual emissions intensity will help facilities to meet their net emissions intensity limit. Facilities that reduce their annual emissions intensity below their net emission intensity limit are eligible to request emission performance credits. More information regarding emission performance credits can be found in Section 4.2 below.

Examples of facility improvements include:

Example 1: Technology Improvements

Technology improvements can include adapting new technologies that increase energy efficiency, retrofitting existing equipment, adapting more efficient practices to improve a facility's performance. Improving energy efficiency will often improve emissions intensity, and can also improve competitiveness and productivity over the long-term.

Technology improvements can also be made to reduce the total quantity of greenhouse gas emissions that are actually released to the atmosphere.

Example 2: Maintenance

Maintenance procedures can be implemented to reduce greenhouse gas emissions. For example, fugitive emissions represent a significant portion of total facility emissions for some industrial operations. Regular maintenance, including leak detection and repair programs and equipment replacement can often help reduce fugitive emissions without sacrificing production, improving emissions intensity. Note that quantification methods for fugitive emissions must be sufficiently defensible to support greenhouse gas emissions reduction claims.

Example 3: Fuel Switching

The type of fuel used in combustion activities at a facility has a significant effect on the amount of resulting greenhouse gas emissions. Switching to a fuel that releases a smaller quantity of emissions per unit of energy produced can help to reduce annual emissions intensity.

For example, using biomass as a combustion fuel can potentially help to reduce emissions intensity. The Intergovernmental Panel on Climate Change (IPCC) guidelines assume that CO_2 emissions from the combustion of biomass materials are sustainably produced and therefore, are inventory neutral. Accordingly, under the *Regulation*, CO_2 emissions from the combustion of biomass must be reported,

but are excluded from a facility's total annual emissions and emissions intensity calculations.

4.2 *Emission Performance Credits*

Emission performance credits are issued for reductions of specified gases that occur at facilities regulated under the *Specified Gas Emitters Regulation*. Emission performance credits may be issued to facilities for each tonne of CO_2e that their total annual emissions is less than the product of their net emissions intensity limit and total production for the compliance year. Alberta Environment will review all requests for emission performance credits and, if approved, will issue serial numbers for the credits generated. Once serialized, these credits may be banked for use in future compliance cycles, transferred to another regulated facility, or sold.

4.2.1 Generating Emission Performance Credits

Emission performance credits must result from direct, demonstrable improvements to a regulated facility, and cannot be generated through changes in reporting methodology or through swings in facility production. In addition, emission performance credits can only be generated from reductions in emissions that are included in a facility's total annual emissions calculation. Reductions of industrial process emissions, CO_2 emissions from combustion and decomposition of biomass, and indirect emissions do not affect annual emissions intensity, and are not eligible to generate emission performance credits.

Facilities that are eligible to request emission performance credits for a compliance period must include an Emission Performance Credit Request form with their compliance submission. Alberta Environment may reject an emission performance credits request in part or whole if it is determined that the requested credits did not result from actual facility improvements, do not align with the intent of the *Regulation*, or fail to meet the requirements of the *Regulation*. Emission performance credits may be revoked at any time if it is later determined that they do not meet these requirements.

Once it has been determined that emission performance credits meet the requirements described above and can be approved, facilities will be notified in writing.

4.2.2 Emission Performance Credit Serialization and Tracking

Emission performance credits are approved, serialized and tracked using the following process:

1) Facilities that are eligible to request emission performance credits must submit an Emission Performance Credit Request form to Alberta Environment with their compliance report submission;
2) Alberta Environment will review each emission performance request as part of the compliance report review process;
3) If a submission meets program requirements, Alberta Environment will approve the emission performance credits request and notify the facility in writing;

4) Alberta Environment will create the emission performance credits, will issue serial numbers for approved credits, and will notify the facility in writing;

5) Credit transactions will occur as bilateral agreements between buyers and sellers. All documentation associated with the transaction of credits should be kept available;

6) Facilities wishing to submit emission performance credits for compliance will be required to submit proof of ownership of the credits, including serial numbers; and

7) Alberta Environment will retire the emission performance credits after the submitting facility's compliance report is accepted as complete.

Alberta Environment plans to implement a registry for serialization and tracking of emission performance credits similar to the Alberta Emissions Offset Registry, which will come into effect in advance of the 2010 compliance submission deadline.

Note: *Alberta Environment regulates at the facility level and, as such, issues emissions performance credits to the facility demonstrating the reductions. Alberta Environment does not track joint venture ownership or other contractual obligations that may affect ownership of credits. It is the facility's responsibility, once the credits have been serialized, to transfer the ownership of credits to appropriate parties.*

4.2.3 Submitting Emission Performance Credits for Compliance

Emission performance credits can only be used once and **cannot** be submitted for compliance in the year in which they were generated. For example, emissions performance credits requested in the compliance report for the 2010 compliance year will be reviewed and, if approved, would be available for use in the 2011 compliance year. All serialized emissions performance credits remain valid until they are submitted for compliance or revoked by Alberta Environment. All emissions performance credits used as a compliance option are retired upon use and are no longer available for use as a compliance option.

Transfer of ownership and retirement of emissions performance credits must be negotiated through contractual agreements between the parties involved. Emissions performance credits must be owned by one of the companies with controlling interest of, and must be allocated to, the facility submitting them for compliance.

4.3 Offset Credits

Emissions offset credits are generated through reductions of specified gases resulting from activities not covered by the *Regulation* or otherwise required by law. The intent of the Alberta offset system is to encourage voluntary emissions reductions that would not otherwise have occurred. Offset credits cannot be generated from reductions that occur at regulated facilities.

Section 7 of the *Specified Gas Emitters Regulation* requires that offset credits meet the following eligibility criteria to be considered valid for use as a compliance option. The reductions must:

- Occur in Alberta;
- Result from actions not otherwise required by law;
- Result from actions taken on or after January 1, 2002;
- Occur on or after January 1, 2002;
- Be real, demonstrable, and quantifiable;
- Have clearly established ownership; and
- Be counted once for compliance purposes;

In addition to the requirements stated above, Alberta Environment also requires that offset projects be:

- Implemented according to a quantification protocol approved by Alberta Environment;
- Be third party verified by a qualified person meeting the requirements for a third party auditor described in section 18 of the *Specified Gas Emitters Regulation*; and
- Be registered on the Alberta Emissions Offset Registry.

More information regarding the offset protocol development and offset project development processes can be found in the Technical Guidance for Offset Protocol Developers and in the Technical Guidance for Offset Project Developers available on Alberta Environment's website at http://environment.alberta.ca/02275.html.

4.3.1 Offset Project Documentation

Offset projects registered on the Alberta Emissions Offset Registry must provide the following project documentation.

To be submitted once for each offset project at the start of the project:

- Offset Project Plan;

To be submitted once for each serial number range of offset credits (typically completed once per vintage year, but can include multiple vintage years):

- Offset Project Report;
- Greenhouse gas assertion (Notice of Creation);
- Verification Report, including:
    - Signed Conflict of Interest Checklist;
    - Signed Statement of Qualifications; and

- Signed Statement of Verification.

These documents are displayed on the registry and serve as a permanent reference for each offset project. Having these documents publicly available does not replace a company's due diligence during offset credit transactions. Companies should do their own due diligence when purchasing offset credits.

4.3.2 Submitting Offset Credits for Compliance

Companies submitting offset credits for compliance with the Regulation must request retirement for the serial ranges being submitted. The registry will issue a confirmation of initiation of retirement to the company. This confirmation of initiation of retirement must be submitted to Alberta Environment as part of the facility's compliance submission. Final retirement of the offset credits will be confirmed by Alberta Environment as part of the facility's compliance review.

Facilities submitting offset credits for compliance with *the Regulation* are responsible for confirming that all required documentation for the project is available on the registry. Where information has not been posted on the registry, facilities are required to obtain and submit copies (electronic or hard copies) of all outstanding project documentation as part of their compliance submission.

The Alberta Emissions Offset Registry will process all requests for retirement in the order that they were received. Project developers and regulated facilities are encouraged to submit all project documentation, including requests for retirement, as early as possible to allow sufficient time to process the request. Please note that Alberta Environment does not guarantee that requests submitted after March 1 will be processed in time for use in the current compliance year. Alberta Environment will not accept offset credits for compliance that have not been serialized, and where retirement has not been initiated on or before March 31.

4.3.3 Offset Credit Error Correction

Alberta Environment reviews all offset projects that are submitted for compliance and conducts a post-verification audit on a portion of these credits. Where errors or discrepancies are detected, Alberta Environment will contact the project developer to establish an appropriate path forward. All errors will be assessed on a case-by-case basis, and the required corrective action will depend on the nature and the magnitude of the error.

When material discrepancies are identified, the project developer will be notified that corrections are required for credits from the affected project to be eligible. If corrections are required, the project developer will have until March 1 of the year following the year in which the offset credits were submitted for compliance to make the required changes. During this time, the offset project will be flagged on the registry, and no further transactions will be permitted. Revised projects must undergo a complete verification, using a verifier appointed by Alberta Environment. If the revised project is verified and

submitted by March 1, adjustments will be made on the registry, which may include a portion of the offset credits being removed, and the remaining offset credits will be available for use.

If the project cannot be corrected by March 1, all offset credits associated with that project will be revoked. The project developer will then have until March 1 of the following year to make the required corrections and successfully complete an audit in which the auditor is appointed by Alberta Environment and the audit is paid for by the project developer. If the project passes the audit, it can be registered on the registry and the newly-serialized credits will be available for use on a go-forward basis.

Projects that cannot be resolved within a year will be permanently removed from the Alberta offset system.

Whenever offset credits are revoked or removed from the registry, affected facilities will be required to replace affected credits through payment into the Climate Change and Emissions Management Fund at the fund credit price applicable to the compliance year for which the credits were submitted.

Corrections to serialized offset credits will be applied in the following manner:

- Corrections will be attributed to the serial number range(s) in which the problem occurred. Credits will be retracted or revoked proportionally across the vintage years to which the correction applies, unless finer serial number division is available.
- Corrections will first be applied to any un-purchased tonnes held by the project developer.
- If the project developer does not hold sufficient tonnes to account for the entire correction, remaining corrections will be assigned proportionally to all parties owning offset credits in the affected serial range(s).
- If unretired offset credits are owned in the affected serial range, correction may first be taken from unretired tonnes.
- For shortfalls that apply to offset credits already submitted for compliance under the *Regulation*, the correction will be allocated in proportion to the amount of tonnage used in each compliance year for each facility that submitted the credits.

Corrective actions between buyers and sellers of offset credits are determined through contractual arrangements between the two parties and are outside the scope of the *Regulation*.

If Alberta Environment becomes aware of fraudulent behaviour, including but not limited to double counting or deliberate misrepresentation of greenhouse gas emissions reductions, appropriate action will be taken. Such action may include, without limitation, revoking all offset credits associated with the project.

4.3.4 Additional Information Regarding Offset Credits

A complete list of approved quantification protocols and offset program guidance documents are available at http://environment.alberta.ca/02275.html. Additional information is also available on the Carbon Offset Solutions website, located at http://carbonoffsetsolutions.climatechangecentral.com.

4.4 Climate Change and Emissions Management Fund Credits

A facility may also achieve compliance with its emissions reduction obligation by purchasing Climate Change and Emissions Management Fund credits (fund credits), where one credit is equal to one tonne of CO_2e. Fund credits must be purchased on or before the compliance submission deadline for use toward a facility's compliance obligation and can only be purchased in whole units. The cost of fund credits is currently set at $15 per tonne of CO_2e, and is subject to change in the future. Fund credits cannot be banked or traded, and must be submitted for compliance true-up upon purchase.

Fund credits are purchased from the **Minister of Finance, Financial Services Branch, Alberta Environment**. Fund credit payments must be accompanied by a fund credit purchase form. For each purchase, the dollar value stated on this form must match the dollar value paid to the Minister of Finance.

Facilities wishing to purchase fund credits should:

1. Calculate number of whole tonnes of CO_2e required to achieve compliance, and the portion which will be achieved through fund credits.
2. Calculate the total value of the fund credits being purchased at a cost of $15 per tonne CO_2e owed (use the Fund Credit Purchase form, which can be found in the SGER Consolidated Reporting Form).
3. Submit payment and the Fund Credit Purchase form to (made payable to "Minister of Finance"):

   Minister of Finance
   Financial Services Branch
   Alberta Environment
   6th floor, South Petroleum Plaza
   9915 108 Street NW
   Edmonton, Alberta
   T5K 2G8
4. Fund credit purchase receipts will be issued within 10 working days of receiving the payment.
5. Financial Services Branch will send the stamped fund credit purchase receipt to the facility and forward a copy to the Director, which will be added to the facility's compliance file.

Companies may purchase fund credits for one or more regulated facilities owned by the same company at the same time by submitting a cheque for the total number of CO_2e equivalent units required. One completed purchase form for the entire purchase must be

included with the payment. This form must allocate all purchased fund credits to the facilities submitting them for compliance. The submitted Fund Credit Purchase form will be stamped with a fund credit receipt number and will function as a purchase receipt.

5.0 Estimation and Reporting of Specified Gases

The *Specified Gas Emitters Regulation* applies to any facility that has released 100,000 tonnes or more of CO_2e in any year since 2003 based on the sum of direct emissions of carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulphur hexafluoride (SF_6). Table 2 provides a list of the specified gases covered under the *Regulation* and each associated 100-year global warming potential used to calculate CO_2e emissions.

Specified Gas	Formula	100-year GWP
Carbon Dioxide	CO_2	1
Methane	CH_4	21
Nitrous Oxide	N_2O	310
Sulphur Hexafluoride	SF_6	23900
Perfluorocarbons (PFC)		
Perfluoromethane	CF_4	6500
Perfluoroethane	C_2F_6	9200
Perfluoropropane	C_3F_8	7000
Perfluorobutane	C_4F_{10}	7000
Perfluorocyclobutane	c-C_4F_8	8700
Perfluoropentane	C_5F_{12}	7500
Perfluorohexane	C_6F_{14}	7400
Hydrofluorocarbons (HFC)		
HFC-23	CHF_3	11700
HFC-32	CH_2F_2	650
HFC-41	CH_3F	150
HFC-43-10mee	$C_5H_2F_{10}$ (structure: $CF_3CHFCHFCF_2CF_3$)	1300
HFC-125	C_2HF_5	2800
HFC-134	$C_2H_2F_4$ (structure: CHF_2CHF_2)	1000
HFC-134a	$C_2H_2F_4$ (structure: CH_2FCF_3)	1300
HFC-143	$C_2H_3F_3$ (structure: CHF_2CH_2F)	300
HFC-143a	$C_2H_3F_3$ (structure: CF_3CH_3)	3800
HFC-152a	$C_2H_4F_2$ (structure: CH_3CHF_2)	140
HFC-227ea	C_3HF_7 (structure: CF_3CHFCF_3)	2900
HFC-236fa	$C_3H_2F_6$ (structure: $CF_3CH_2CF_3$)	6300
HFC-245ca	$C_3H_3F_5$ (structure: $CH_2FCF_2CHF_2$)	560

Table 2: Specified gases and gas species subject to the *Regulation*.

5.1 Negligible Emissions

Negligible emissions are direct emissions from on-site sources that are very small in magnitude and are not expected to increase or vary significantly on an annual basis. The

negligibility threshold has been set at the **lesser** of 1000 tonnes CO_2e or 1 per cent of a facility's total annual emissions, on an aggregate basis.

If the aggregate emissions total from all sources deemed to be negligible falls below the negligibility threshold, these emissions may be excluded from the total annual emissions calculation. Facilities should be aware of any changes to negligible sources that may increase emissions beyond the negligibility threshold and should notify Alberta Environment of any such changes. Alberta Environment may periodically request re-evaluation of a facility's negligible sources to ensure that they remain below the negligibility threshold.

If negligible emission sources exist at a facility, the following should be provided:

In the baseline emissions intensity application:

- A conservative estimate of the magnitude and annual variation of each emission source to be treated as negligible. If this was not provided in the application for the approved baseline emission intensity, it should be provided in the next annual compliance report.

In each annual compliance report:

- A list of on-site sources that existed in the compliance period that are deemed to be negligible and confirmation that these sources have not changed significantly; and
- A conservative estimate, as above, for any sources present in the compliance period that were not present in the baseline period.

5.2 Emission Source Categories

Source categories have been established to provide additional information regarding greenhouse gas emissions in Alberta and to facilitate special treatment of certain types of emissions (e.g. exclusion of industrial process emissions from the annual emissions intensity calculation). Details regarding each source category are provided in Sections 5.2.1 through 5.2.10 below.

Emissions of CO_2, CH_4, and N_2O must be disaggregated and reported according to the following source categories:

- Stationary Fuel Combustion
- Industrial Process
- Venting
- Flaring
- Fugitive/Other
- On-site Transportation
- Waste and Wastewater
- Formation CO_2
- CO_2 from Combustion of Biomass
- CO_2 from Decomposition of Biomass

Emissions of HFC, PFC, and SF_6 must be disaggregated and reported according to the following source categories:

- Industrial Process
- Industrial Product Use (release of emissions that do not qualify as Industrial Process)

Table 3 provides an overview of the greenhouse gas types that must be reported for each source category and whether the associated emissions are included in the total direct emissions and total annual emissions calculations.

Source Category	Specified Gas	Reported	Total Direct Emissions (TDE)	Total Annual Emissions (TAE)
Industrial Process	All	✓	✓	×
Industrial Product Use	HFC, PFC, SF_6	✓	✓	✓
Stationary Fuel Combustion	CO_2, CH_4, N_2O	✓	✓	✓
Venting	CO_2, CH_4, N_2O	✓	✓	✓
Flaring	CO_2, CH_4, N_2O	✓	✓	✓
Fugitive/Other	CO_2, CH_4, N_2O	✓	✓	✓
Waste and Wastewater	CO_2, CH_4, N_2O	✓	✓	✓
On-site Transportation	CO_2, CH_4, N_2O	✓	✓	✓
Formation CO_2	CO_2	✓	✓	✓
CO_2 from Combustion of Biomass	CO_2	✓	✓	×
CO_2 from Decomposition of Biomass	CO_2	✓	✓	×

Table 3: Summary of the Specified Gas Emitters Regulation reporting requirements by source category and specified gas.

5.2.1 Stationary Fuel Combustion

Stationary fuel combustion emissions are direct emissions resulting from non-vehicular combustion of fuel for the purpose of energy production (e.g. to generate electricity, heat or steam), and include emissions from waste combustion/incineration where waste materials are used directly as a fuel or converted to fuel for the purpose of energy production. Stationary fuel combustion is a common source of greenhouse gas emissions and is found in most industrial sectors.

Note that N_2O and CH_4 emissions from combustion of biomass are included in the stationary fuel combustion category if the combustion is used for energy production.

5.2.2 Industrial Process

Industrial process emissions are direct emissions from an industrial process involving chemical or physical reactions other than combustion, and where the primary purpose of the industrial process is not energy production. Industrial process emissions are not found in all industrial sectors.

Where an industrial process involves multiple emissions sources that can be quantified separately, only the emissions meeting the definition of industrial process can be included in this category. This source category is intended to apply to industrial processes that are integral to facility production where the only option for reducing the emissions would be to scale back production. If the product of an industrial process is combusted or vented (e.g. hydrogen being used as a fuel or flared or vented rather than as a process feed stock) the emissions associated with that product are not considered industrial process emissions and must be quantified and reported under the most appropriate emissions category.

Industrial process emissions are included in the threshold emissions calculation, but are excluded from the total annual emissions calculation. Alberta Environment is currently reviewing the treatment of the industrial process source category and may introduce a reduction target on these emissions for future compliance.

The following are examples of industrial process emissions that have been approved by Alberta Environment:

- CO_2 from steam methane reforming for various uses including ammonia production
  - $CH_4 + 2H_2O \longrightarrow 4H_2 + CO_2$
- CO_2 from the calcination of lime stone for clinker production and quick lime production
  - $CaCO_3 \longrightarrow CaO + CO_2$
- CO_2 liberated from phosphate bearing rock exposed to acids during phosphoric acid production
- N_2O from nitric acid production

Facilities that are unclear on whether an emissions source meets the definition of industrial process emissions should discuss with Alberta Environment before submitting their compliance report.

5.2.3 Venting

Venting emissions are direct emissions from intentional releases to the atmosphere of a waste gas or liquid stream including, but not limited to: emissions of casing gas, treater, stabilizer, dehydrator off-gas, blanket gas and emissions from pneumatic devices, which use natural gas as a driver, compressor start-up, pipeline and other blow downs and metering and regulation station control loops. Formation CO_2 emissions are not included in this source category.

5.2.4 Flaring

Flaring emissions are direct emissions from the controlled combustion of a gas or liquid stream produced on site, but not for the purpose of energy production, and include, without limitation, emissions from waste petroleum incineration, hazardous emissions prevention systems (whether in pilot or active mode), well testing, natural gas gathering systems, processing plant operations, crude oil production, pipeline operations, petroleum refining, chemical fertilizer production, and steel production. The flaring category does not include emissions from combustion of biomass or landfill gas.

5.2.5 Fugitive/Other

Fugitive/other emissions are direct emissions that do not fit into the stationary fuel combustion, industrial process, venting, flaring, on-site transportation, waste and wastewater, formation CO_2, CO_2 from combustion of biomass, or CO_2 from decomposition of biomass categories, and include without limitation intentional or unintentional releases of gases arising from the production, processing, transmission, storage and use of solid, liquid or gaseous fuels.

In general, fugitive/other emissions result from the handling or processing of various types of fuel in the fossil fuel industry. Fugitive/other sources include leaks from natural gas transmission lines and processing plants, accidental releases from oil and gas wells, and releases from the mining and handling of coal.

5.2.6 Formation CO_2

Formation CO_2 emissions are direct emissions of CO_2 that is recovered or is recoverable from an underground reservoir and is gaseous at conditions under which its volume is measured or estimated. This source category includes, without limitation, CO_2 venting from gas sweetening.

5.2.7 Waste and Wastewater

Waste and wastewater emissions are direct emissions from on-site waste disposal and waste/wastewater treatment, and include emissions from landfilling of solid waste, flaring of landfill gas, treatment of liquid waste, and waste incineration, but exclude emissions from waste-to-energy operations and CO_2 emissions from decomposition and combustion of biomass.

Note that CH_4 and N_2O emissions from combustion of biomass and landfill gas are included in the Waste and Wastewater category if the combustion is not for energy production.

5.2.8 On-site Transportation

On-site transportation emissions are direct emissions resulting from fuel combustion in machinery used for the on-site transportation of products and materials integral to the production process. Examples of on-site transportation include:

- Transportation of raw or intermediate products and materials within the production process such as equipment used at an oil sands operation to mine and/or move materials to subsequent on-site processing;
- Equipment used at above or below ground mining operations to mine and/or move mined materials;
- Equipment used to transport intermediate products or materials to different on-site production processes;
- Equipment used to handle or load final product for transport; and
- Transportation of bi-products or wastes, such as mining overburden or tailings.

On-site vehicle emissions associated with emergency vehicles, staff transportation, and maintenance may optionally be excluded from the total direct emissions and total annual emissions calculations (i.e. are not required to be reported), but must be excluded or included consistently between the approved baseline emissions intensity application and associated compliance reports for each facility.

5.2.9 CO_2 from Combustion of Biomass

Carbon dioxide emissions from combustion of biomass are included in this category. Biomass includes wood and wood products, charcoal, agricultural residues, trees, crops, grasses, tree litter, roots, municipal and industrial wastes where the organic material is biological in origin, landfill gas, bio-alcohols, black liquor, sludge gas, and animal or plant-derived oils. Emissions from this source category are included in the total direct emissions calculations, but not in the total annual emissions calculation.

Note that CH_4 and N_2O emissions from combustion of biomass are included in either the stationary fuel combustion category or the waste and wastewater category.

5.2.10 CO_2 from Decomposition of Biomass

Carbon dioxide emissions resulting from decomposition of biomass are included in the threshold determination and total direct emissions calculations, but not in the total annual emissions calculation.

Note that CH_4 and N_2O emissions from waste decomposition are included in the waste and wastewater category.

5.3 Reporting of Hydrofluorocarbons (HFC), Perfluorocarbons (PFC) and Sulphur hexafluoride (SF_6)

Hydrofluorocarbon (HFCs), perfluorocarbon (PFCs), and sulphur hexafluoride (SF_6) emissions occur in small volumes relative to the principle specified gases—carbon dioxide (CO_2), methane (CH_4) and nitrous oxide (N_2O)—but have high global warming potentials. Consequently, Alberta Environment requires all emissions of HFCs, PFCs, and SF_6 associated with facility production to be calculated and reported according to the following source categories:

1) **Industrial Process**: The same description of industrial process emissions as in Section 5.2.2 above applies for emissions of HFCs, PFCs, and SF_6. As with CO_2, CH_4, and N_2O, industrial process emissions of HFCs, PFCs, and SF_6 are not included in the total annual emissions calculation.

2) **Industrial Product Use**: Industrial product use emissions are all emissions of HFCs, PFCs, and SF_6 associated with production that do not meet the definition of industrial process.

Note that HFC, PFC, and SF_6 emissions associated with emergency equipment, office refrigerators, office air conditioning, and other sources not related to production are excluded from threshold and baseline emissions calculations. In cases where it is unclear which category emissions of HFC, PFC, and SF_6 belong to, Alberta Environment should be contacted to discuss the matter.

5.3.1 Hydrofluorocarbon (HFC)

Hydrofluorocarbons are a family of synthetic gases that contain carbon, hydrogen and fluorine. Although emissions of hydrofluorocarbons are usually very small, species of HFC often have very large global warming potentials, ranging from 140 to 11700 times that of carbon dioxide (see Table 2).

Examples of HFC sources from industrial product use include emissions from foam blowing and use of HFC as a cover gas in metal production.

5.3.2 Perfluorocarbon (PFC)

Perfluorocarbons are a family of industrial gases. Although emissions of PFC are usually very small, species of PFC have significant global warming potentials ranging from 6500 to 9200 times that of carbon dioxide (see Table 2).

Examples of PFC sources from industrial product use include without limitation emissions from aluminum production and foam blowing.

5.3.3 Sulphur Hexafluoride (SF_6)

Sulphur hexafluoride is a synthetic gas that is relatively inert due to its specific chemical properties. Emissions of SF_6 are usually small, but have a significant global warming potential of 23,900 times that of carbon dioxide (see Table 2).

Examples of SF_6 emissions from industrial product use include emissions of SF_6 used as a cover gas in magnesium smelting and casting, as foundry products in the aluminum industry, and as an insulating gas in electrical equipment such as circuit breakers and on-site power stations.

5.4 Emissions Estimation Methodologies

Facilities **must** use the same calculation methodologies for annual compliance reports that were used in the approved baseline emissions intensity application, including

emission factors, energy equivalence factors, and unit conversions. Facilities are also responsible for ensuring that consistent methods have been used to calculate input data taken from other parts of the operation such as production accounting data.

If facilities wish to change or update calculation methodologies to produce a more accurate emissions and production inventory for future compliance report submissions, they should contact Alberta Environment as soon as possible to discuss the most appropriate path forward. In such cases, restatement of the baseline emissions intensity will likely be required before the new methodology can be used for completion of annual compliance reports.

In cases where previously used methodologies are unavailable or must be changed for completion of the annual compliance report (e.g. due to changes in metering, temporary data unavailability, etc.), this should be communicated to Alberta Environment before submission of the affected compliance report(s). Depending on the nature and the extent of the change, restatement of the baseline emissions intensity may be required.

More information regarding choice of calculation methodologies and relative accuracy can be found in the Technical Guidance for Completing Baseline Emissions Intensity Applications.

6.0 Calculating Emissions, Production and Emissions Intensity

The process and formulae for calculating a facility's annual emissions, production, emissions intensity, and compliance obligation are provided in this section. The final calculations in the compliance report form are calculated automatically using data that is input by the facility. This section is intended to assist facilities in understanding how the calculations are completed and in verifying the calculated information internally before submitting their compliance reports to Alberta Environment.

6.1 Total Direct Emissions

The total direct emissions value is the sum total of all direct greenhouse gas emissions at a facility expressed in carbon dioxide equivalent tonnes (tonnes CO_2e). The total direct emissions value is calculated by summing the CO_2e emissions value for each greenhouse gas type reported in each source category.

6.2 Total Annual Emissions

The total annual emission value is the sum total of all direct greenhouse gas emissions excluding emissions from the industrial process, CO_2 from biomass combustion, and CO_2 from biomass decomposition categories expressed in tonnes CO_2e.

6.3 Total Production

The production value is the total annual quantity of saleable output, except where an output is not produced. Each facility must establish an appropriate production metric that accurately reflects the primary greenhouse gas activities and operations of the facility. In cases where multiple products are produced, all major production items associated with the release of greenhouse gases must be included and each product should be expressed in a common unit. Where possible, production should be expressed in the *International System of Units* (SI units).

The production metric should result in a stable denominator if facility operations remain unchanged. By having a stable denominator metric, facilities will be able to demonstrate real reductions in greenhouse gases as a change in emissions per unit production occurs.

The *Specified Gas Emitters Regulation* describes production, in section 1(1), as the quantity, expressed in the applicable units of production, of

(i) end product produced by a facility, or
(ii) any input, output or other thing specified under subsection (4) of the *Regulation.*

Subsection (4) of section 1 of the *Regulation* states that:

*If a facility **does not** produce an end product, the Director may specify an input, output or other thing as the standard of measurement of production of the facility for the purposes of this Regulation.*

Facilities that do not have an end product (e.g. landfills) may use an alternate production denominator, but should contact Alberta Environment do discuss the most appropriate metric as part of the baseline emission intensity application process.

Facilities **must** use the same production metric for their annual compliance reports as was used in the approved baseline emissions intensity application. Alberta Environment may require use of a different production metric if it is determined that the current metric does not align with the criteria described above.

Note: *Alberta Environment has accepted some facility compliance submissions using alternate production metrics to calculate production. These include refinery activity index (RAI) and inlet gas. Use of these alternates is being reviewed to better understand their relevance, appropriateness, and applicability to reduction targets. Facilities using these alternate denominator metrics must also submit actual production data with their annual compliance reports.*

6.4 Emissions Intensity

Emissions Intensity is a measure of the greenhouse gas emissions required to produce each unit of production on an annual basis, and is calculated as the ratio of total annual emissions to production, as follows:

$$EI = TAE / P$$

Where:

EI is annual emissions intensity
TAE is total annual emissions, and
P is total annual production.

Note that emissions intensity and the values discussed in the following subsections are calculated differently for facilities with cogeneration. More information regarding integrated and stand-alone cogeneration calculations is provided in Section 7.0.

6.5 Net Emissions Intensity Limit

For each compliance period, regulated facilities are assigned net emissions intensity limits based on their reduction target and approved baseline emission intensity. The reduction target is 12 per cent for established facilities, and depends on the number commercial operation years for new facilities (see Table 1). The net emissions intensity limit is calculated as follows:

$$NEIL = BEI \times (1 - T)$$

Where:

NEIL is the net emissions intensity limit
BEI is the approved baseline emissions intensity, and
T is reduction target.

6.6 Credit Calculation

Facilities whose emissions intensity exceeds their net emission intensity limit are required to submit credits such that the net emissions intensity is equal to or less than the net emissions intensity limit. Conversely, facilities whose annual emissions intensity is lower than their net emission intensity limit are eligible to request emissions performance credits. The following formula is used to determine the number of credits that must be purchased to achieve compliance or the number of emissions performance credits that may be requested:

$$C = TAE - (NEIL \times P)$$

Where:

C (in tonnes CO_2e) is the facility compliance obligation:
if C is positive, it represents the number of credits required to achieve compliance
if C is negative, it represents the number of emission performance credits eligible to be requested
TAE is total annual emission
NEIL is net emissions intensity limit, and
P is total annual production.

Note that compliance (C) is always rounded to the nearest integer value in tonnes CO_2e. Fund credits, offset credits and emissions performance credits cannot be created or submitted in partial units. For example, a value of 100.4 tonnes CO_2e will round down to 100 tonnes CO_2e and 100.5 tonnes CO_2e will round up to 101 credits.

6.7 Net Emissions Intensity Calculation

The facility's net emissions intensity for January 1 – December 31, including compliance actions taken, is compared with the facility's net emissions intensity limit to determine whether the facility has met its reduction obligation for the compliance period. The net emission intensity is calculated using the following the formula:

$$NEI = (TAE - OC - FC - EPC) / P$$

Where:

NEI is net emissions intensity
TAE is total annual emissions

OC is offset credits
FC is fund credits
EPC is emission performance credits, and
P is total annual production.

7.0 Cogeneration

The following section provides guidance to facilities submitting annual compliance reports with either integrated or stand-alone cogeneration for 2010 compliance.

Cogeneration is the combined production of heat for use in industrial facilities and the production of electricity as a by-product. Electricity not used within the plant may be offered to the competitive electricity market. Combined use of heat in production and to generate electricity improves the overall efficiency of the plant and can displace higher emissions coal-generated electricity. Treatment of cogeneration under the *Specified Gas Emitters Regulation* recognizes these environmental benefits associated with the higher energy efficiencies generally afforded by cogeneration operations.

The cogeneration calculation methodology presumes that during the baseline and subsequent compliance periods, the heat was sourced from a conventional boiler operating at an efficiency of 80 per cent and the electricity was produced from a natural gas combined cycle electricity generation plant with a greenhouse gas intensity of 0.418 CO_2e tonnes/MWh. No reduction target is placed on the emissions associated with electricity generation.

7.1 Definitions

Standalone cogeneration facilities are those units that derive all their energy outputs from on-site fuel combustion. These units do not have any other external energy inputs. All the thermal and electrical output should be traced down to a single source. All emissions from a standalone facility should be from cogeneration related equipment.

Integrated cogeneration facilities are those units that, in addition to their own fuel source, also have other sources contributing to generating thermal or electrical output. This source could be combustion at the host site, any exothermic reaction or in some cases import or export of steam from second heat source depending upon demand.

7.2 Cogeneration Reporting Requirements

Reporting requirements for cogeneration facilities differ from reporting requirements for regular facilities. This is to recognize the environmental benefits of the combined generation of heat and electricity at a facility. Facilities that use deemed greenhouse gas emissions must provide the following information in their compliance report:

- Total greenhouse gas emissions (G_T) in tonnes CO_2e from the cogeneration facility for January 1 – December 31.
- Fuel used by the cogeneration facility for January 1 – December 31;
- If fuel factors are used to calculate the greenhouse gas emissions, provide the factors with references;
- If fuel analysis is used to calculate the greenhouse gas emissions, provide a synopsis of the fuel analysis;

- Total net heat production (H) in GJ produced by the cogeneration facility for January 1 – December 31;
- Mass/volume of fuel deemed used to produce heat for January 1 – December 31;
- Total electricity generation (E) in MWh generated by the cogeneration facility (net of station loads) for January 1 – December 31;
- Deemed greenhouse gas emissions from electricity generation (D_E) in tonnes CO_2e for January 1 – December 31.

The reporter must also provide the following information either in the comments section of the compliance report or in a separate document:

- Simple conceptual/logic diagram of the cogeneration layout including boundary, and control volume used for heat calculations;
- A description of the cogeneration unit boundary;
- Explanation of how heat calculations were done, including how the enthalpies were averaged;
- A list of the various thermal streams entering or leaving the cogen boundary and annualized flow averages, temperature averages, and pressure averages for each stream; and
- Hours of operation of the cogeneration facility for January 1 – December 31.

Additional information on heat calculations, cogeneration facility boundaries, etc. is available in the Additional Guidance for Cogeneration.

7.3 Greenhouse Gas Emissions from Cogeneration

Total annual greenhouse gas emissions for both integrated and stand-alone cogeneration facilities are calculated according to the following formula:

$$G_T = f \times M_F$$

Where:

G_T	=	Total greenhouse gas emissions from the cogeneration facility for the year/half-year	[tonnes CO_2e]
f	=	Emission factor for the fuel used in the cogeneration facility	[tonnes CO_2e/unit fuel]
M_F	=	Mass/volume of fuel used in the cogeneration facility during the year/half-year	[units of fuel used]

The Person Responsible may choose to:

1) Calculate site-specific emission factors for the fuel used in the facility based on the compositional analysis of the fuel. If this method is used, the Person Responsible should report the detailed fuel analysis and calculation procedures used to develop the emission factor in their methodology document.
2) Use an industry standard emission factor. If this method is used, the Person Responsible should provide references for the source of the emission factor.

7.4 Deemed Greenhouse Gas Emissions for Electricity Generation

Deemed greenhouse gas emissions are calculated according to the methodology outlined below.

7.4.1 Measure the Total Electricity Generated by the Cogeneration Facility

Deemed emissions associated with electricity generation are calculated based on electrical generation. That is, the calculation should account for the net electricity that crosses the cogeneration boundary (exported to the host facility and the electricity grid). This calculation of electrical generation should be net of station loads (i.e. loads integral to the function of the cogeneration unit).

7.4.2 Calculate the Deemed Greenhouse Gas Emissions for Electricity Generation

Deemed greenhouse gas emissions for a cogeneration facility are based on a NGCC turbine with a deemed greenhouse gas emissions intensity of 0.418 tonnes CO_2e/MWh and are calculated according to the following formula:

$$D_E = 0.418 \times E$$

Where:

D_E	=	Deemed greenhouse gas emissions from electricity generation	[tonnes CO_2e]
E	=	Electricity generation by the cogeneration facility during the year	[MWh]

7.5 Emissions Intensities Calculation

The net emissions intensity calculations differ between integrated and stand-alone cogeneration facilities. Integrated cogeneration units may have multiple products depending on the nature of the facility.

Stand-alone cogeneration facilities produce heat and electricity; however, emissions associated with electricity generation are excluded from the emissions intensity calculation.

Similar to the calculation described in Section 6.7 above, the net emissions intensity is obtained by subtracting all credits used for true-up from the numerators of the following equations. This calculation is done automatically in sheet E5 of the compliance report form, when applicable.

7.5.1 Integrated Cogeneration Facility

The following formula is used to calculate the emissions intensity of an integrated cogeneration facility:

$$EI = \frac{\mathbf{TAE - D_E}}{\mathbf{P}}$$

Where:

EI	=	Emissions intensity for the compliance year.	[tonnes CO_2e / unit of product]
TAE	=	Total Annual Emissions from the entire facility for the compliance period. ***(Excluding:** GHG emissions from industrial process, CO_2 emissions from combustion of biomass and CO_2 emissions from decomposition of biomass but including emissions from the cogeneration unit).*	[tonnes CO_2e]
D_E	=	Deemed greenhouse gas emissions from electricity generation for the compliance period.	[tonnes CO_2e]
P	=	Production for the compliance period.	[appropriate units of production]

7.5.2 Stand-Alone Cogeneration Facility

The emissions intensity for stand-alone cogeneration facilities is calculated using the following formula:

$$EI = \left[\frac{\mathbf{G_T - D_E}}{\mathbf{H}}\right]$$

Where:

EI	=	Emissions intensity for the compliance period.	[tonnes CO_2e / GJ]
G_T	=	Total annual greenhouse gas emissions for the compliance period	[tonnes CO_2e]
D_E	=	Deemed greenhouse gas emissions attributed to electricity generation for the compliance period	[tonnes CO_2e]
H	=	Total net heat produced by the cogeneration facility during the compliance period.	[GJ]

7.6 Significant Change in Cogeneration Unit Operation

If the operation of the cogeneration facility changes such that there is no material production of one of the energy products, all or part of the Cogeneration Adjustment may be removed from the baseline emissions intensity. This situation could arise if the host facility decreased its take of energy from the cogeneration plant such that one or more of the products was no longer used. These situations will be reviewed on a case-by-case basis.

8.0 Data Confidentiality and Access to Information

8.1 Request for Confidentiality

In accordance with section 16 of the *Regulation*, facilities may request certain information in the specified gas compliance report be kept confidential for a period of up to five years on the basis that the information is commercial, financial, scientific or technical information that would reveal proprietary business, competitive or trade secret information about a specific facility, technology or corporate initiative. Confidentiality can be granted to specific information contained in portions of the compliance report, but cannot be granted for the entire compliance report.

To request confidentiality, **a written request must be included with the compliance report that clearly states the specific information to be kept confidential, including justification for each piece of information.** If additional information is requested from the facility by Alberta Environment as part of the compliance report review, the facility may also submit a written request for confidentiality of this information at that time, with appropriate justification for the request.

Each confidentiality request will be reviewed by Alberta Environment and a decision will be rendered by the Director within 150 days from the letter of submission date. During this time, the portions of the information for which confidentiality has been requested will be considered prescribed information under the *Freedom of Information and Protection of Privacy Act*. The confidentiality request and evaluation process is illustrated in Figure 3.

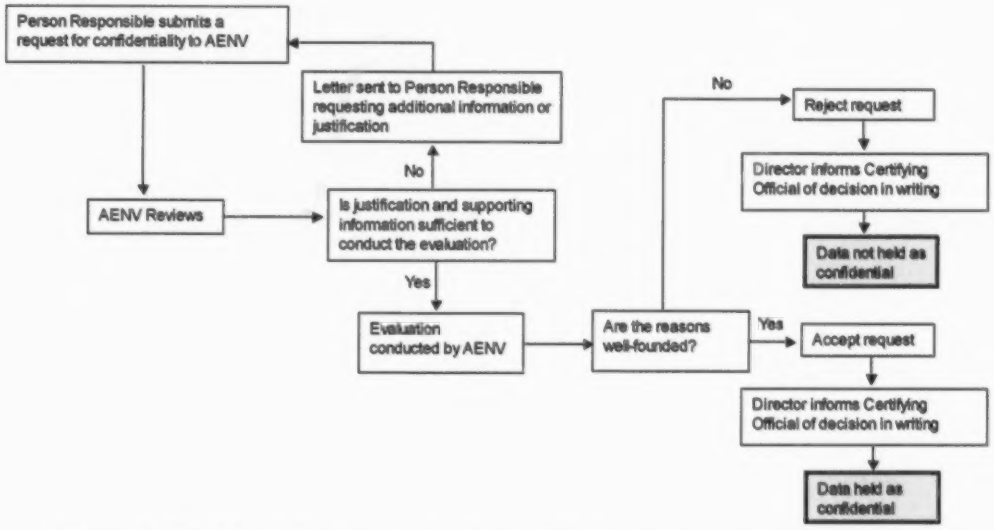
Person Responsible submits a request for confidentiality to AENV
Letter sent to Person Responsible requesting additional information or justification
No
AENV Reviews
Is justification and supporting information sufficient to conduct the evaluation?
Yes
Evaluation conducted by AENV
Are the reasons well-founded?
No
Reject request
Director informs Certifying Official of decision in writing
Data not held as confidential
Yes
Accept request
Director informs Certifying Official of decision in writing
Data held as confidential

Figure 3: Confidentiality process for the specified gas emitters program.

In accordance with section 17 of the *Regulation*, the Director must submit an annual confidentiality report to the Information and Privacy Commissioner, which includes the number of confidentiality requests received, number of confidentiality requests approved, and the period of time prescribed for each approved request.

Note: *Alberta Environment cannot guarantee confidentiality regarding information for which confidentiality has not been requested.*

8.2 Use of Annual Compliance Report Information

Alberta Environment will publish information that is collected through the *Regulation* on a regular basis. Such publications will include facility-level data reported in the compliance report, including, without limitation, total annual emissions, annual emissions intensity, and total compliance obligation (true-up). Prescribed (confidential) information will be published in aggregate form such that individual facility information cannot be identified.

Note that non-confidential information contained in the baseline application or compliance report may be published in any form or manner the Director considers appropriate.

8.3 Access to Annual Compliance Report Information

According to section 13 of the *Specified Gas Emitters Regulation,* persons wishing to access baseline or compliance information that has not been deemed confidential may submit written requests for information directly to the facility. The facility must respond in writing within 30 days of receiving the request. If the facility does not release the requested information, the persons seeking the information may submit a request, including a copy of the correspondence with the facility, to the Director. Alberta Environment will review all requests for information and release information that has not been granted confidentiality Figure 4 shows the process for requesting access to information reported under the *Regulation*.

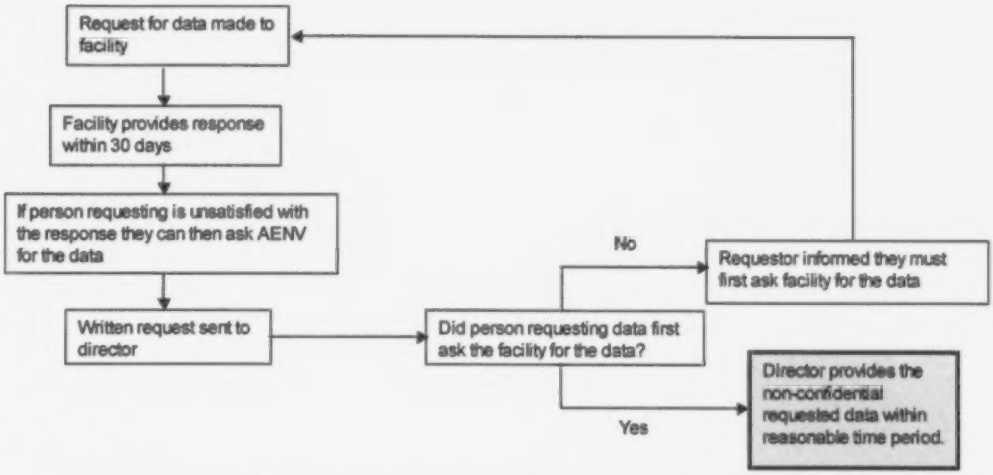
Request for data made to facility
Facility provides response within 30 days
If person requesting is unsatisfied with the response they can then ask AENV for the data
Written request sent to director
Did person requesting data first ask the facility for the data?
No
Requestor informed they must first ask facility for the data
Yes
Director provides the non-confidential requested data within reasonable time period.

Figure 4: Process for requesting non-confidential information reported through the *Regulation*.

9.0 Third Party Verification

Third party verification is intended to provide an independent review of each facility's compliance report before it is submitted to Alberta Environment. This review provides additional assurance that the compliance report is reliable and of sufficient quality to determine the facility's emissions intensity for the compliance period.

The third party verifier must verify that the facility's compliance report has been completed in an accurate and appropriate manner, consistent with the baseline emissions intensity application and the criteria set out by Alberta Environment. The third party review must identify unresolved discrepancies in the compliance report submission, and identify areas where calculation or submission of the reported data is not consistent with the guidance provided by Alberta Environment. Where there is deviation from published guidance, the third party verifier should check facility records to confirm that the facility has received approval in writing from Alberta Environment. If the facility has not received written approval, the third party verifier must disclose these discrepancies in the verification report. If the discrepancies result in a material error, the third party verifier will not be able to issue a statement of verification for the facility's compliance submission.

The requirement for independent, third party verification of greenhouse gas inventories is consistent with international standards. The verification report is used for information purposes to assist Alberta Environment in reviewing and understanding each facility's submission. Facilities are encouraged to review the verification findings, and where possible, make corrections prior to submission of their compliance report. This helps to ensure greater accuracy and reduce the time required for Alberta Environment to complete an internal review of the compliance submission.

The final audience for the verification report is Alberta Environment. All report must meet the requirements outlined in Section 9.2.6 below. Verification reports that do not meet these requirements may be deemed incomplete and not accepted by Alberta Environment, and could result in the facility being deemed out of compliance with the *Regulation*.

Alberta Environment will conduct annual audits on approximately 10 per cent of submitted compliance reports. Alberta Environment's audit process is described in more detail in Section 10.0.

9.1 Verification Fundamentals

9.1.1 Terminology

Assurance refers to the confidence level that a third party verifier uses to express a written conclusion concerning a facility's compliance assertion.

Compilation refers to completion of a facility's compliance report submission, which may be done internally by the reporting company or by a qualified external body contracted by the reporting company. Third party verifiers cannot provide compilation or consulting and third party verification services for the same compliance assertion.

Compliance Assertion refers to the information being verified. In the case of compliance report submissions, the compliance assertion is the greenhouse gas emissions, production quantities, cogeneration data, emissions intensity value, and compliance obligation reported in the Specified Gas Compliance Report.

Designated signing authority refers to an individual who has binding authority for the verification company. This person must meet the requirements of section 18 of the *Specified Gas Emitters Regulation.* This person's signature is provided on behalf of the verification team on the statement of qualifications, statement of verification, and conflict of interest checklist.

Lead verifier is the individual leading the verification team. This person is responsible for coordinating the verification and ensuring that appropriate expertise is available to review all aspects of a facility's compliance report.

Limited assurance (or negative assurance) is a moderate level of assurance. Limited assurance is based on identifying anomalies rather than confirming an assertion.

Materiality refers to a threshold measure for the cumulative magnitude of errors, omissions, discrepancies, and misrepresentation that affect an assertion. Materiality is discussed further in Section 9.1.8.

Peer reviewer is an independent qualified professional who reviews the third party verification. This person cannot be the lead verifier.

Reasonable assurance (or positive assurance) is a high level of assurance. Reasonable assurance is a direct factual statement expressing the opinion of the verifier.

Third party verifier describes the person or persons conducting the independent, third party verification of the facility's submission.

Verification describes the process used by a third party verifier to comment on a conclusion regarding a facility's compliance assertion.

9.1.2 Qualifications of the Third Party Verifier

The third party verifier (lead verifier and verification team) is defined as a qualified person or persons that make up a verification team that verifies and provides assurance on a facility's annual compliance report.

The designated signing authority is an individual capable of binding the verification company. This person must be an accountant registered under the *Alberta Regulated*

Accounting Profession Act (or equivalent) or a professional engineer registered under the *Engineering, Geological and Geophysical Professions Act* (or equivalent), and must be in good standing with the associated professional organization. The designated signing authority must sign and submit the statement of qualification, statement of verification, and conflict of interest checklist provided in the compliance report form.

The lead verifier must be able to demonstrate training in one of the three acceptable verification methodologies discussed in Section 9.1.5. The lead verifier may also be the designated signing authority, but cannot be the peer reviewer.

The verification team must have technical expertise and competency in the following areas:

- Data audit practices and data verification standards
- The *Specified Gas Emitters Regulation* and associated requirements
- Verification criteria and their appropriate application within the defined scope of the verification
- Sector-specific areas, including:
  - Knowledge of specific greenhouse gas activities and technologies
  - Identification and selection of greenhouse gas sources, sinks, and reservoirs
  - Quantification, monitoring and reporting, including relevant technical and sector issues
  - Situations that may affect the emissions intensity value during typical and atypical operating conditions

Reminder: The *Electronic Transactions Act* allows for the use of electronic signatures in place of written signatures. Electronic signatures must be sufficient to identify the person signing and must be consistent with the purpose of the document or record being signed. Alberta Environment will accept electronic signatures for the purposes of compliance under the *Specified Gas Emitters Regulation*, but reserves the right to request signed originals where the electronic signature is ambiguous or cannot be verified.

Note: Signatures on behalf of a corporation are not acceptable under the *Specified Gas Emitters Regulation*, which requires the third party verifier to be an individual. If a verifier wishes to sign on behalf of a corporation, sign-off maybe completed as follows:

Company Name
Per [name and signature of Corporate Binding Official]

9.1.3 Accreditation of Verifiers

Alberta is working with national accreditation bodies to adopt certification requirements for third party verifiers. Alberta Environment will provide more information on accreditation of third party verifiers when information is available.

9.1.4 Independence

Independence is a surrogate measure for objectivity, and is a key qualification for third party verifiers. Third party verifiers must have appropriate systems in place to document independence, and must be able to demonstrate independence for all verification team members.

The following threats to independence should be assessed by both the facility and third party verifier before the third party verification is commenced:

1. **Self-interest threat**: This occurs when the verifier or a member of the verification team or a person in the chain of command for the verification could directly benefit from a financial interest in the verification client, or when there is any other self-interest conflict with respect to the verification client. For example:
    - Owning shares of the verification client;
    - Having a close business relationship with the client;
    - Contingent fees relating to the results of the engagement;
    - Potential employment with the verification client; or
    - Undue concern about the possibility of losing the verification or other fees from the client.

2. **Self-review threat**: This occurs when a member of the verification team could be in a position of reviewing his or her own work. For example:
    - Involvement of the verification organization in the compilation of the data contained in the assertion, including documentation.
    - A verification organization member performing non-verification services that directly impinge on the client's assertion, such as implementing the greenhouse gas or production data management systems; and
    - A member of the verification engagement team having previously been a greenhouse gas or production data compiler of the verification client or who was employed by the verification client in a position to exert direct and significant influence over the client's assertion being reviewed.

3. **Advocacy threat:** This occurs when a verifying organization or a member of the verification team or a person in the chain of command for the verification promotes, or may be perceived to promote, a verification client's position or opinion to the point that objectivity may, or may be perceived to be, compromised. For example:
    - Dealing in, or being a promoter of, emission performance credits on behalf of a verification client; and
    - Acting as an advocate on behalf of the verification client in litigation or in resolving disputes with third parties.

4. **Familiarity threat:** This occurs when, by virtue of a close relationship with a verification client, its directors, officer or employees, the firm or a member of a

verification engagement team becomes too sympathetic to the client's interests. For example:

- A person on the verification team has a close personal relationship with a person who is in a critical greenhouse gas or production compilation role at the verification client; and
- Acceptance of significant gifts or hospitality from the verification client.

5. **Intimidation or economic dependence threat**: This occurs when a member of the verification team or a person in the chain of command is deterred from acting objectively and exercising professional scepticism by threats, actual or perceived, from the directors, officers or employees of the verification client. For example:
   - The threat of being replaced as third party verifier due to a disagreement with the application of greenhouse gas quantification methodology;
   - Fees from the verification client represent a large percentage of the overall revenues of the third party verifier.
   - The application of pressure to inappropriately reduce the extent of work performed in order to reduce or limit fees; and
   - Threats arising from litigation with a verification client.

If it is determined that there is a real or potential conflict of interest, and both parties wish to pursue the engagement, written evidence must be provided to Alberta Environment prior to the verification describing the actions that will be taken to manage the potential conflict in order to preserve actual and perceived independence. Alberta Environment will assess all potential conflict of interest cases. In cases where it determined that a potential conflict of interest cannot be effectively managed, facilities will be required to select an alternate third party verifier.

Impartiality must be monitored throughout the verification process. If an actual or perceived conflict of interest is identified, the facility must notify Alberta Environment and work with the third party verifier to manage the conflict.

Alberta Environment recognizes that some familiarity with a facility and its processes is helpful in reviewing a facility's compliance report or baseline emissions intensity application. However, Alberta Environment also recognizes that a close relationship between facilities and verifiers can compromise a third party verifier's impartiality over the long term. Consequently, Alberta Environment has implemented a limitation whereby facilities must not acquire verification services from the same lead verifier or verification company for more than five compliance cycles without an interval of two consecutive compliance cycles. Note that a facility's initial baseline emissions intensity application is considered a compliance cycle, but resubmission of a previous compliance report or baseline emissions intensity application is not considered an additional compliance cycle.

Note: *In certain situations, Alberta Environment may require the use of a new or a different third party verifier prior to the five year limit. Examples of when this may be*

required include, but are not limited to, adverse audit conclusions or multiple restatements of compliance and/or baseline submissions.

9.1.5 Verification Standards

Third party verifiers must use one of the following verification standards and must be able to demonstrate how they meet the qualification criteria for the standard being used:

- ISO 14064-3 (Greenhouse Gases – Part 3): Specification with guidance for the validation and verification of greenhouse gas assertions
- Standards for Assurance Engagements, Canadian Institute of Chartered Accountants (CICA) Handbook – Assurance Section 5025
- International Standard on Assurance Engagements (ISAE) 3000 – Assurance Engagements Other Than Audits or Reviews of Historical Financial Information

These standards ensure a consistent level of rigour in the verification process such that a peer verifier or auditor would come to the same conclusion as the original verifier.

The following documents provide guidance to assist the verifier in completing the third party verification:

- Climate Change and Emissions Management Act
- Specified Gas Emitters Regulation
- Technical Guidance for Completing Specified Gas Compliance Reports
- Technical Guidance for Completing Specified Gas Baseline Emissions Intensity Applications
- Additional Guidance on Cogeneration Facilities
- Technical Guidance for Offset Project Developers

9.1.6 Verification Criteria

Verification criteria will be established by the third party verifier prior to the site visit. Criteria must be set to test that the facility's compliance report adheres to the regulatory requirements in the *Regulation,* and that emissions and production were correctly calculated in a transparent and replicable manner consistent with the approved baseline. As such, verification criteria will vary between facilities. An overview of the verification criteria and sampling plan should be appended to the verification report.

9.1.7 Peer Review Process

Peer review is a required part of verification under the *Regulation*. The peer review process requires that persons different from those who undertook the verification work (i.e. assessed the greenhouse gas information system and its controls, the greenhouse gas data and information, and conducted the assessment against the verification criteria) perform a final evaluation of the evidence and conclusions of the verification team.

The name and qualifications of the peer reviewer must be provided in the verification report along with the members of the verification team. Note that the peer reviewer may also be the designated signing authority, but cannot be the lead verifier or have been involved in the verification work.

9.1.8 Materiality

Materiality refers to a threshold for errors, omissions, and misrepresentations (discrepancies) in a facility's compliance assertion. Materiality affects a third party verifier's ability to issue a statement of verification. The materiality threshold for compliance with the *Regulation* has been set at two different levels, depending on the facility's total annual emissions in the verification period, as shown in Table 4.

Total Annual Emissions	Materiality Threshold
< 500 kt CO_2e	5 per cent
≥ 500 kt CO_2e	2 per cent

Table 4: Materiality threshold levels for compliance report submissions.

Materiality is assessed on the total magnitude of the errors, omissions or misrepresentations, regardless of the combined effect of overstatements and understatements. For example, a 3 per cent overstatement combined with a 3 per cent understatement in emissions would result in a 6 per cent combined discrepancy in the facility's submission. This is considered a 6 per cent material discrepancy despite having a net zero impact on the compliance submission.

Third party verifiers cannot issue a statement of verification for a compliance assertion that contains unresolved material discrepancies. Material discrepancies must be resolved before a verification statement may be issued.

Discrepancies under the materiality threshold are deemed **immaterial**. These discrepancies are assessed on a case-by-case basis to determine appropriate corrective action. A third party verifier may issue a statement of verification for a compliance submission that has unresolved immaterial discrepancies. However, unresolved immaterial errors must be identified and detailed in the verification report.

Discrepancies can be further categorized as either quantitative or qualitative. **Quantitative discrepancies** are those of a numerical nature, where the magnitude of the discrepancy can be estimated or calculated to a reasonable degree of accuracy. Examples include input data inaccuracies, omission of sources, and inappropriate application of calculation methodology. Quantitative errors are assessed against the materiality threshold.

Qualitative materiality refers to errors or mistakes that are non-numerical in nature or are difficult to quantify, and may include inconsistent methods or facility boundaries, misleading presentation of circumstances, poor data handling or record keeping, and lack of transparency. These errors can erode a third party verifier's ability to reach a necessary level of comfort with the compliance assertion and may result in a qualified or adverse assurance statement. Determining whether a material qualitative discrepancy has occurred is at the professional judgment of the third party verifier.

Alberta Environment also considers materiality on an aggregate basis across the program. Small errors on a large emission source may be below a quantitative material threshold for a facility, but may result in a large, financial cost relative to total program compliance costs. As such, all identified immaterial errors will be assessed to understand both facility materiality and program impact, and corrections will be determined accordingly.

9.1.9 Level of Assurance

Alberta Environment requires all compliance reports be verified to a **limited** level of assurance. This requires the verifier to obtain and check information through enquiry, analytical procedures, and discussion. Greenhouse gas verification completed to a limited level of assurance is more stringent than financial verification at a negative level of assurance, but is not sufficient to reach a positive conclusion regarding the compliance assertion.

Alberta Environment will be adopting reasonable assurance for third party verification starting January 1, 2012 for the 2012 compliance year. Compliance reports for the 2011 year due March 31, 2012 may be verified to limited assurance. All offset credits generated on or after January 1, 2012, and 2012 facility compliance reports due March 31, 2013 will be required to meet this higher level of assurance.

9.2 Verification Process

9.2.1 Engaging a Third Party Verifier

Each regulated facility is responsible for completing a compliance report and engaging a third party verifier to conduct verification of the compliance assertion. Facilities must ensure that the third party verifier engaged to complete the verification meets the qualification requirements identified in Section 9.1.2 above and the independence requirements described in Section 9.1.4 above.

Once a third party verifier has been selected, the facility and the verifier should work together to determine an appropriate timeframe and schedule for the verification. This will include identifying key contacts for the facility, setting dates for site visits, and estimating a completion date for the verification. This allows both parties to set up an appropriate verification schedule to complete the verification as efficiently as possible.

9.2.2 Verification Plan and Sampling Plan

Third party verifiers should design a verification plan and a sampling plan to support a limited level of assurance for each compliance report review.

The **verification plan** documents the terms of the engagement and the planned verification procedures. The final verification activities are determined based on preliminary testing and risk identification. It is expected that the verification plan, in part or full, will be shared with the facility prior to the site visit in order to assist in preparation for both the site visit and document requests. This is particularly important

when facilities need to make arrangements for appropriate staff to be present to support the review.

The verification plan should:

1. State the objectives of the verification.
2. State the level of assurance to be provided in the verification.
3. Assess the potential risks in the data management system by
    a. Assessing the inherent, control, and detection risk associated with greenhouse gas data and data management system to determine areas for further investigation.
    b. Performing analytical testing on the draft compliance assertion to determine areas for further investigation.
4. Assess the potential magnitude of any errors, omissions and misreporting by conducting a magnitude and sensitivity analysis on the reported data to determine parameters that significantly effect the compliance assertion.
5. Set an initial quantitative materiality level for any errors, omissions or misreporting.
6. Show the connections between the verification objectives, risks, magnitude of errors, anomalies, materiality, and procedures, and take into account the greenhouse gas data management systems as this determines the control risk for the next verification process. For example, one objective should be to determine whether the greenhouse gas emissions inventory is complete. The verification procedures for this objective could include:
    - A site visit to inspect and visual confirm the greenhouse gas inventory.
    - Enquiring how the client ensured completeness of the greenhouse gas inventory.

The **sampling plan** is a supporting document that is finalized once the verifiers have done an initial assessment of the robustness of the facility's greenhouse gas emissions data and emission management systems. The sampling plan typically identifies the sampling areas and sample sizes required to achieve a level of comfort with the reported data to support a limited level assurance review.

Third party verifiers are encouraged to use a risk-based approach to develop the sampling plan. More emphasis should be placed on sources with a higher likelihood for error and/or a greater ability to materially affect the compliance submission. Where errors or weaknesses are determined, the verifier may request additional supporting information to understand the error and its overall impact on the submission.

A summary of the final verification plan and sampling plan, including any deviations or changes that were made during the verification, must be included in or appended to the final verification report submitted to Alberta Environment.

9.2.3 Site Visits

Site visits are required as part of the verification process, Site visits are used to confirm information contained in compliance report submissions, including the completeness and accuracy of emissions sources, products, measurement/estimation methods, data tracking systems, and boundary conditions.

In some circumstances, a site visit may be determined to be not feasible (e.g. for a large distributed pipeline network), or not necessary. A site visit should only be considered unnecessary in cases where no changes have occurred in the facility's operations (i.e. emissions sources, products, and boundaries, etc.), and where a maximum of eight months has elapsed since the previous site visit from the same third party verifier. For example, if a verifier has recently conducted a site visit when verifying a baseline restatement and is then verifying a compliance submission a few months later. Whenever a site visit is omitted, the third party verifier should confirm that this is acceptable with Alberta Environment prior to completing the verification and must provide clear and adequate justification regarding why the site visit was not conducted and what proxy data will be used as a substitute for the site visit. The intent is that each original compliance submission verification will include a site visit.

9.2.4 Access to Information and Supporting Materials

Facilities must provide sufficient information to allow third party verifiers to evaluate completeness of the compliance report and render an assurance statement. Documents and information required to complete the verification will be facility specific and may include, but are not limited to:

- The baseline emissions intensity application and supporting documents;
- The compliance report containing the compliance assertion to be verified;
- A description of the site processes;
- Assessment of boundary conditions;
- A simplified process flow diagram;
- Data flow sheets;
- An inventory of greenhouse gas sources;
- A brief description of the greenhouse gas data management system and quantification protocol used to calculate the greenhouse gas emissions;
- Sample calculations, including justification for negligible emission sources;
- Key supporting documents used to compile the compliance report; and
- Access to the facility to conduct a site visit.

Facilities can assist the verification process by having all relevant documents and records collated and available for the third party verifier prior to commencement of the verification. Facilities should also ensure that appropriate staff members are available to answer questions and provide information throughout the entire process.

It is important that key personnel are made available during the site visit, as this greatly improves the verifier's ability to check data in a timely and efficient manner. Facilities

should be prepared for the verifier to trace data and methodologies back to the raw data sources.

9.2.5 Closing meeting

The verification process typically concludes with a close-out meeting between the facility and the third party verifier to review the verification findings and attempt to resolve outstanding issues prior to submitting the compliance report. Third party verifiers are encouraged to provide a copy of the draft report to the facility in advance of the close-out meeting.

9.2.6 Verification Report

The verification report is a summary and discussion of the third party verifier's verification procedures and results. This report is submitted to Alberta Environment as part of the facility's compliance report package. It should be sufficiently complete to provide Alberta Environment assurance that the values reported in the compliance report are accurate and correct based on the information available.

The verification report must contain the following:

- The verification objective;
- The criteria against which the compliance assertion and supporting evidence was evaluated;
- A summary of the final verification plan;
- A summary of the final sampling plan;
- A complete verification schedule;
- The names, roles, and qualifications of verification team members and peer reviewer;
- A risk assessment;
- All findings identifying any material and immaterial discrepancies found; and
- A limited level assurance statement for the compliance report.

Table 4 contains a sample table of contents for a verification report that meets the requirements identified above.

Section	Content
1. Verification Summary	Summary table containing: Facility identification information Facility contact information Verification objective Verification summary Audit team members Report and audit dates
2. Introduction	Provide an introduction to the facility and the verification. This should include a description of the facility, the approved baseline emissions intensity, the net emissions intensity limit, and a summary of changes at the facility since the baseline

	period.
3. Objective	Discuss the objective of the verification
4. Scope	Discuss the scope of the objective
5. Verification Criteria	List the verification criteria used and any relevant, supporting documentation used
6. Final Verification Plan and Sampling Plan	Provide a detailed discussion of the final verification plan including: • Methodologies • Key emissions sources • Final sampling plan • Other relevant information
7. Verification Schedule	Provide a list of verification activities and dates
8. Verification Procedures	Identify steps taken during the verification including: • Methodologies used to assess/verify emissions data • Comparison with approved baseline emissions intensity • Details of site visit • Other relevant information
9. Verification Findings	Discuss findings and results: • Material and immaterial discrepancies identified • Data management system and controls • Emissions sources • Production • Process flow diagram for the facility • Facility boundary compared with the facility definition under the *Regulation* • Statement of findings
10. Statement of Verification	This must be the Statement of Verification from the compliance report form
11. Verification Team	Clearly identify all team members (including the peer reviewer), and their respective duties.
12. Appendix	Any relevant documentation such as methodologies, and calculations that provide clarity and assist Alberta Environment in assessing the completeness of the review. A summary of the final verification plan and final sampling plan

Table 5: Third party verification report template.

Working papers do not need to be included in the verification report, but should be retained by the verifier for at least five years. If Alberta Environment requires access to the verifier's working papers, Alberta Environment will contact the facility to obtain access.

9.2.7 Statement of Verification

There are three verification statement types that can be issued for a limited level of assurance verification:

1. A limited level assurance statement;
2. A qualified limited level assurance statement; and
3. An adverse assurance statement.

A **limited level assurance statement** is issued by the third party verifier if the verifier is satisfied that they have undertaken sufficient procedures and there has been sufficient and appropriate evidence supplied to determine that nothing has come to their attention that causes them to believe that the compliance assertion provided in the compliance report is not fairly stated in accordance with the appropriate criteria. This report may be issued despite with outstanding, unresolved immaterial discrepancies.

The following is an example of a limited level assurance statement:

> "Based on our work, nothing has come to our attention that causes us to believe that the compliance assertion provided in the 20XX compliance report for the YYYY facility is not, in all material respects, presented fairly and in accordance with the relevant criteria."

A **qualified assurance statement** is issued if the verifier is unable to form an opinion on certain aspects of the compliance report due to circumstances beyond the control of the third party verifier or facility personnel. Examples include the disposal of records in a manner compliant with regulations and the destruction of records in a natural disaster. Limitations on the scope of the assurance should be clear in the statement of verification and the reasons for the limitation should be disclosed in the verification report. Further guidance is provided in ISO 14064-3, Annex A.2.9.2.

The following is an example of a qualified assurance statement:

> "Based on our work, there was not sufficient and appropriate evidence to support a conclusion regarding the compliance assertion provided in the 20XX compliance report for the YYYY facility. Readers are cautioned that the compliance assertion for this period may not be appropriate for their purposes. Therefore, we are issuing a qualified statement of assurance that based on our work, nothing has come to our attention that causes us to believe that the compliance assertion provided in the 20XX compliance report for the YYYY facility is not, in all material respects, presented fairly and in accordance with the relevant criteria."

An **adverse assurance statement** is issued in rare cases where there are outstanding, unresolved material discrepancies. Adverse assurance statements may be issued, for

example, if the verifier cannot access sufficient information to assess the validity of the compliance report.

The following is an example of an adverse assurance statement:

> "Based on our work, the 20XX compliance report for the YYYY facility does not contain all the disclosures required by Alberta Environment. Readers are cautioned that these statements may not be appropriate for their purposes."

For regulated facilities to be in compliance with the *Regulation*, compliance report submissions must be accompanied by a limited level of assurance statement. In cases where a limited level of assurance statement cannot be provided by the submission deadline, facilities **must** inform Alberta Environment as soon as possible to discuss the most appropriate path forward.

9.2.7.1 Content of the Statement of Verification

The statement of verification (form SoV in the compliance report) must be completed, signed and submitted to Alberta Environment and is the final assurance statement for the third party verification. The statement of verification must:

- Identify the associated compliance report for which verification was provided, including the applicable time period;
- Include the compliance assertion that was verified;
- Describe the responsibilities of the third party verifier and the reporting company;
- Identify the verification standard used to conduct the verification;
- Provide a conclusion that conveys the level of assurance being provided and/or any reservation the verifier may have; and
- Include the signature of the designated signing authority.

9.3 Issues Arising During the Verification

Third party verifiers may encounter problems during the verification process, such as errors in the data entry, incomplete emissions sources, and other qualitative and quantitative discrepancies that affect the completeness and accuracy of the facility's compliance report.

If material errors are discovered, they must be corrected before submission of the affected compliance report. If immaterial errors are discovered, facilities are encouraged to make the corrections; however, compliance reports can be verified and submitted with unresolved immaterial errors. More information on materiality is available in Section 9.1.8.

9.4 Verification for Resubmissions

In situations where facilities re-submit previously submitted compliance reports with corrections, updates, or changes, verification will be required on either the changes only or the entire report, depending on the nature and the extent of the changes.

Minor changes and clarifications will typically require a signed letter from the verifier stating what was changed, the rational for the change, and that no other changes were made to the compliance report will be required. When changes are significant or affect multiple portions of the compliance report, a complete verification may be required. In some cases Alberta Environment may require that a new third party verifier be used.

9.5 Subsequent Events

Third party verifiers are not required to actively monitor the validity of their reports after issuance. However, where it is brought to the attention of the third party verifier that a previous statement is no longer accurate, they must notify the facility. The facility must notify Alberta Environment to discuss further follow-up actions that may be required.

10.0 Alberta Environment Audit

Alberta Environment has committed to auditing approximately 10 per cent of the annual compliance reports. These audits are being undertaken to check the accuracy of the reported information and to identify anomalies. Information will be used to ensure transparency in the specified gas emitters program and to support an annual program review and assessment.

10.1 Audit Process

Alberta Environment's audit process, illustrated Figure 5 below, begins with a request for proposals to conduct the audits. Auditors are hired based on whether they meet the requirements for a third party auditor described in section 18 of the *Specified Gas Emitters Regulation*, their audit experience, and their sector specific expertise. Auditors hired by Alberta Environment must meet the same independence requirements as third party verifiers; an audit team will not be assigned to complete a facility audit if there is an actual or perceived conflict of interest, unless sufficient action can be taken to ensure independence.

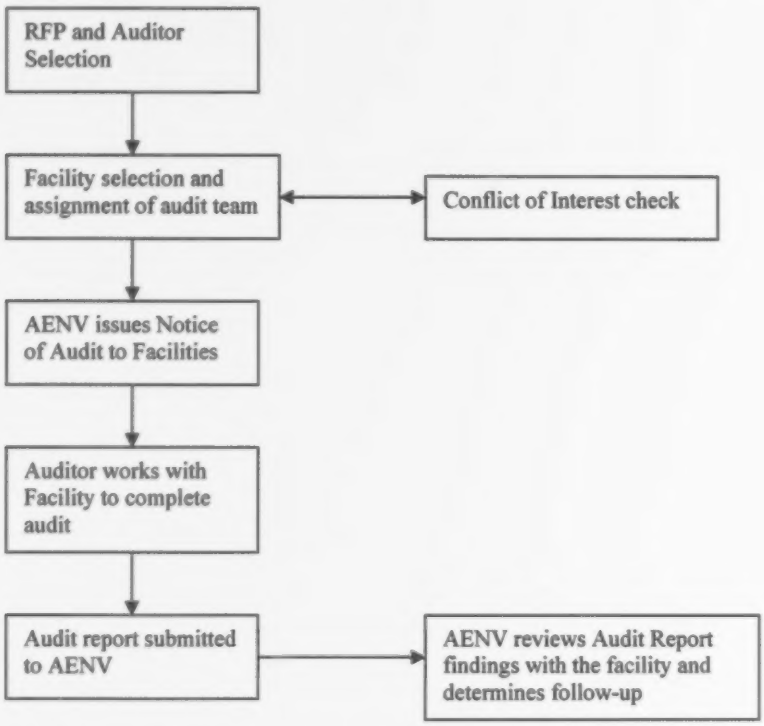
RFP and Auditor Selection
Facility selection and assignment of audit team
Conflict of Interest check
AENV issues Notice of Audit to Facilities
Auditor works with Facility to complete audit
Audit report submitted to AENV
AENV reviews Audit Report findings with the facility and determines follow-up

Figure 5: Schematic illustration of Alberta Environment's compliance report audit process.

After auditors have been selected, Alberta Environment conducts an internal review process to determine which facility's compliance reports will be audited based on the

criteria stated in Section 10.2 below. Auditors are then assigned to the selected compliance reports based on budget, scheduling, and auditor expertise.

Once auditors have been assigned, Alberta Environment issues written notice to the facilities indicating they have been selected for a supplemental audit. Auditors will work directly with the facilities to set up an appropriate audit schedule and to request supplemental information required to complete the audit.

Auditors are required to perform a site visit. Details of the site visit and audit are included in the verification plan, which is shared with the facility before the site visit.

Auditors may schedule a close out meeting with the facility to discuss key findings; however, the audit report **must** be submitted directly to Alberta Environment. Alberta Environment reviews the final audit findings and concludes the audit by meeting with the facility to determine what, if any, follow-up action is needed. Alberta Environment will work with the facility to address outstanding issues. If no follow-up is required based on the audit findings, the facility will receive written notice confirming completion of the audit.

10.2 Facility Selection

Alberta Environment uses a risk-based approach to select facilities for auditing, the criteria used to select facilities for audit include:

- Coverage across facilities and sectors;
- Facility size (annual emissions and production);
- Product and process complexity;
- The number previous audits a facility has undergone
- The results from previous audits;
- Familiarity of sectors/facilities within Alberta Environment's Climate Change Secretariat;
- Issues related to the applicability of baseline emissions intensities (e.g. if Alberta Environment is concerned that the BEI may not represent ongoing facility operations).
- Anomalies or issues encountered during the desktop review; and
- The number and extent of previous restatements that have been made.

Note: *Some facilities may be audited more than once or be audited several times in succession.*

10.3 Materiality for Alberta Environment Audits

Alberta Environment uses the same materiality threshold for audits as for third party verification (see Section 9.1.8). Auditors must assess both quantitative and qualitative errors associated with a compliance report to reach a limited level of assurance regarding the compliance assertion. Auditors are required to identify all material and immaterial errors discovered during the audit in the Audit Report. Alberta Environment will then

work with the facility to determine appropriate corrective actions, as discussed in Section 3.8.

10.4 Audit Methodology

Auditors must use one of the following three audit methodologies consistent with verification methodology requirements:

- ISO 14064-3 (Greenhouse Gases – Part 3): Specification with guidance for the validation and verification of greenhouse gas assertions
- Standards for Assurance Engagements, Canadian Institute of Chartered Accountants (CICA) Handbook – Assurance Section 5025
- International Standard on Assurance Engagements (ISAE) 3000 – Assurance Engagements Other Than Audits or Reviews of Historical Financial Information

Auditors will select the methodology appropriate to their audit. Methodology used by the auditors may be different from the methodology used by the third party verifier.

10.5 Level of Assurance

Alberta Environment requires all audits be performed to at least a limited level of assurance, consistent with the requirements for third party verification. However, Alberta Environment may request some audits be performed at a reasonable level of assurance.

10.6 Audit Report

Auditors must produce an audit report for each audited facility. This report must meet the same requirements identified for verification reports in Section 9.2.6, and must be submitted directly to Alberta Environment.

10.7 Continuous Improvement

Alberta Environment is committed to continuous improvement. Alberta Environment will undertake an annual review of the specified gas emitters program, particularly during the initial years of the program. Results from the audit process will be used to provide input into what areas are working and what areas need adjustments. As such, Alberta Environment has asked its auditors to identify any issues encountered during the audit, which serves as part of an independent review of the specified gas emitters program.

Glossary of Terms

Act means the *Climate Change and Emissions Management Act*

Baseline emissions intensity is the emissions intensity reference calculated by the facility and approved by the director.

Biomass refers to material derived from living or recently dead organisms. Examples include but are not limited to: wood and wood products, charcoal, agricultural residue, landfill gas, and bio-alcohols. A more complete list is available in Section 5.2.9.

Biomass emissions are direct emissions resulting from the decomposition and/or combustion of biomass from plant materials and animal waste.

Certifying official is the person designated by the facility with signing authority for that facility.

Climate Change and Emissions Management Act is the enabling legislation passed in 2002 allowing Alberta Environment to manage greenhouse gas emissions in the province.

Climate Change and Emissions Management Fund is the fund set up under the Climate Change and Emissions Management Act that is used to support research, development and deployment of transformative change technologies to reduce greenhouse gas emissions in Alberta.

Compliance assertion is the greenhouse gas emissions, production quantities, cogeneration data, emissions intensity value, and compliance obligation.

CO_2e is the 100-year global warming potential average of a unit of greenhouse gas (e.g. methane) compared to an equivalent unit of carbon dioxide (reference gas).

Direct emissions means the release of greenhouse gases from all sources located at a facility.

Director is Alberta Environment's representative appointed under the *Specified Gas Emitters Regulation* and who is charged with implementing the *Regulation*.

Emissions intensity is a facility's total annual emissions divided by production as calculated in Section E1 of the compliance report form. The emissions intensity is compared to the approved baseline emissions intensity to calculate the credits required or generated in the compliance period.

Emissions offset is a reduction in one or more specified gases (regulated greenhouse gas emissions) occurring at sites not covered by the *Regulation*, which can lead to the production of an offset credit.

Emission performance credits are generated when a facility reduces its emissions intensity below its net emissions intensity limit. Emissions performance credits are awarded on a tonne CO_2e reduction basis

Established facility is a facility that completed its first year of commercial operation on or before January 1, 2000, or that has completed eight consecutive years of commercial operation.

Facility is any plant, structure or thing that sits on one or more contiguous or adjacent sites that are operated and function in an integrated fashion and includes all buildings, equipment, structures, machinery and vehicles that are an integral part of the activity.

Flaring emissions are direct emissions from the controlled combustion of a gas or liquid stream produced on site for purposes other than producing energy. This includes but is not limited to the incineration of waste petroleum and other hazardous materials, safety flares, and test wells.

Formation CO2 emissions are direct, gaseous emissions of carbon dioxide recovered or recoverable at a well from an underground reservoir including, but not limited to, CO_2 emissions vented from gas sweetening and formation gas.

Fund credit is a compliance option used by making a payment made in to the Climate Change and Emissions Management Fund.

Greenhouse gases are the atmospheric gases responsible for the greenhouse gas effect. The most common greenhouse gases are carbon dioxide (CO_2), methane (CH_4) and nitrous oxide (N_20). Less prevalent, but very powerful, greenhouse gases include hydrofluorocarbons (HFCs), perfluorocarbons (PFCs) and sulphur hexafluoride (SF6).

Global warming potential measures a greenhouse gas's relative warming effect on the earth's atmosphere compared with carbon dioxide and is expressed as a 100-year average. Alberta Environment currently utilizes the global warming potential value published in the International Panel on Climate Change Second Assessment Report for the gases regulated under the *Regulation*.

HFC species are hydrofluorocarbon gases and include: CHF_3, CH_2F_2, CH_3F, $C_5H_2F_{10}$ (structure: $CF_3CHFCHFCF_2CF_3$), C_2HF_5, $C_2H_2F_4$ (structure: CHF_2CHF_2), $C_2H_2F_4$ (structure: CH_2FCF_3), $C_2H_3F_3$ (structure: CHF_2CH_2F), $C_2H_3F_3$ (structure: CF_3CH_3), $C_2H_4F_2$ (structure: CH_3CHF_2), C_3HF_7 (structure: CF_3CHFCF_3), $C_3H_2F_6$ (structure: $CF_3CH_2CF_3$) and $C_3H_3F_5$ (structure: $CH_2FCF_2CHF_2$). These gases are regulated under the *Regulation*.

Industrial process emissions are direct emissions from sources directly associated with production that involve chemical or physical reactions, other than combustion, and where the primary purpose of the process is not energy production.

Industrial product use emissions are all direct emissions from the use of HFCs, PFCs or SF_6 associated with production that do not meet the definition of Industrial Process Emissions. Examples include SF_6 and HFC use as a cover gas and SF_6 in on-site industrial electrical equipment.

Materiality refers to a measure of the magnitude of an error omission or misrepresentation that would affect the compliance assertion stated in the baseline emissions intensity application or compliance statement.

Net emissions intensity is the facility's total annual emissions minus true-up options used (offset credits, emissions performance credits, or fund credits), all divided by the facility's total annual production expressed in appropriate units.

Net emissions intensity limit is the facility's maximum net emissions intensity permitted under section 4 of the *Regulation.* This limit is set at 88 per cent of the baseline emissions intensity for existing facilities. New facilities are phased in at a rate of 2 per cent per year starting in their fourth year of commercial operation.

New facility is a facility that completed its first year of commercial operation on or after December 31, 2000 and has completed less than eight years of commercial operation.

On-site transportation emissions are direct emissions resulting from fuel combustion in machinery used for the on-site transportation of products and material including raw, intermediate and end products, wastes or land clearing.

Other/fugitive emissions are direct emissions that do not fall under the other emissions categories and includes without limitation, intentional or unintentional releases of gases arising from the production, processing, transmission, storage and use of solid, liquid or gaseous fuels.

Person responsible is the person legally responsible for the operations of the facility. This person is the approval or registration holder for the facility regulated under the *Environmental Protection and Enhancement Act* or the legal owner of the facility for facilities not subject to EPEA approval.

PFC species are perfluorocarbon gases and include: CF_4, C_2F_6, C_3F_8, C_4F_{10}, c-C_4F_8, C_5F_{12}, and C_6F_{14}. These gases are subject to the *Regulation.*

Production is the total quantity of end product(s) produced by a facility. If a facility does not have an end product, the Director under the *Regulation* may specify an input, throughput or other thing as a production metric.

Regulation means the *Specified Gas Emitters Regulation.*

Reporter is the person designated by the facility responsible for completing the facility's baseline emissions intensity application and compliance report form.

Specified gases are the six greenhouse gas species—carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), PFCs, HFCs, and sulphur hexafluoride (SF_6)—regulated under the *Climate Change and Emissions Management Act* and the *Regulation.*

Stationary fuel combustion emissions are direct emissions from the combustion of fossil or biomass fuel for the purpose of producing energy excluding CO_2 emissions from the combustion of biomass.

Total annual emissions are the total direct emissions not including industrial process emissions, CO_2 emissions from combustion of biomass and CO_2 emissions from decomposition of biomass waste emitted by a facility in a calendar year.

Total direct emissions means the release of all specified gases expressed in tonnes CO_2e from all sources located at a facility.

Third party verifier is a professional engineer or chartered account qualified to conduct an independent, third party review of the facility's annual compliance report before it is submitted to Alberta Environment.

Unit of production is an appropriate, common production metric for all end products of a facility consistent with the industry accepted norms for the sector to which the facility belongs.

Venting emissions are direct emissions from the intentional release to the atmosphere of waste gas or liquid streams.

Waste and wastewater emissions means direct emissions from disposal or treatment of waste or wastewater, but does not include CO_2 emissions from decomposition of biomass waste.

Year is calendar year.

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